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Speciation of UK emissions of non-methane volatile organic compounds

N R Passant

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Executive Summary

This report has been prepared under the DEFRA research programme 'Emission Factors and Cost Curves for Air Pollutants' (reference EPG 1/3/134). This programme includes research aimed at improving the characterisation of emissions of non-methane volatile organic compounds (NMVOC) in the National Atmospheric Emissions Inventory (NAEI). An important element of this characterisation is an understanding of the chemical components which make up the emissions of NMVOC from each type of source. To fulfil this requirement the NAEI includes a series of NMVOC species profiles which describe the chemical components of emissions from each source. The profiles give a list of the species present in emissions, each with a percentage of total NMVOC emissions which is emitted as that species. A species profile might therefore look as follows:

ethane	15%
propane	20%
butane	30%
methylpropane	20%
pentane	10%
methylbutane	5%

When the profile is applied to the NMVOC emission for the relevant source, the emissions of the individual species are obtained, the sum of these being equal to give the NMVOC emission. These species profiles are subject to varying degrees of uncertainty and are subject to an ongoing programme of improvement. This report documents improvements to the species profiles made as a result of research carried out on the aforementioned DEFRA research programme, presents the species profiles used in the 1999 and 2000 versions of the NAEI and makes recommendations for further work. This report supersedes earlier reports on speciation such as Marlowe *et al*, 1992; Rudd, 1995; Passant & Lymbridi, 1998; and Jenkin *et al*, 2000.

As a result of this programme, the NAEI now includes 111 species profiles, although only 86 of these were used in the 1999 NAEI. Of the rest, some are new profiles generated by recent research documented in this report and will be used for the 2000 NAEI. The remaining profiles are used in the generation of other species profiles but are not applied directly to emission sources (for example species profiles for certain solvents such as hydrocarbon mixtures). The full collection of species profiles contain nearly 700 chemical species or groups of species and photochemical oxidant creation potentials (POCP) for each one have been added to the NAEI.

A considerable effort which has gone into the development of the NMVOC species profiles, consequently we believe that the NAEI speciated NMVOC inventory is fairly robust, certainly as far as identifying which of the families of organic species (e.g. alkanes, alcohols, ketones etc.) are emitted by each process, and accurately identifying the major species emitted. The main area of uncertainty in the speciated inventory is likely to be in the detailed information – whether the contributions assumed for each species in a given profile are accurate, and whether minor components have been identified. Broadly, there are four factors leading to uncertainty/error in the speciated inventory:

1) some minor emission sources do not have species profiles and therefore the emission is treated as unspeciated;
2) some emission sources are speciated with incomplete species profiles which contain one or more unspeciated components;
3) some emission sources are speciated using species profiles which have been 'borrowed' from a different emission source on the basis of an assumption that the characteristics of emissions from both sources will be very similar. In some or all cases this assumption may be wrong;
4) some emission sources are speciated using species profiles which are assumed to be realistic for that source, but which are not accurate. An example of this might be where a source is speciated using a profile based on measurements of a different source which is assumed to have the same species profile.

Of these factors, the fourth is likely to be the most significant source of uncertainty and to address this factor in particular a number of recommendations are made in the report. These are given below, divided into a number of different themes.

Further assessment of existing profiles

- More information is needed on the data used to derive a number of US EPA profiles that are used in the speciation module, so that a better judgement can be made as to whether the US profiles are 'appropriate' to the UK situation.
- The need for a profile for emissions from abatement devices which oxidise emissions should be reviewed periodically.
- The adequacy of profiles for stationary combustion processes with regard to benzene should be considered further and, if necessary, new profiles developed.

Consultation with industry and other experts

- Species profiles used for oil exploration and production, refining and distribution of petroleum products might be improved through the input of data provided by the petroleum industry. The industry's trade associations should be given the opportunity to review the existing profiles and suggest improvements.
- Solvent suppliers and users should be given greater encouragement to review species profiles used for solvent-using processes, particularly with the objectives of providing comment on the various assumptions made, and advising of significant changes in product formulations.

Development of new or improved profiles

- Profiles could be developed or improved for the following sources:
  Forests
  Chemical industry
  Small 2-stroke engines such as those used in garden equipment
  Other food: animal feed manufacture
  Brewing: barley malting
  Spirit manufacture: barley malting
  Other food: margarine and other solid fats
  Domestic combustion of natural gas

- Profiles would be useful for the following solvent/hydrocarbon types:

de-aromatised white spirit
rubber solvent
additional SBP solvents, including aromatic hydrocarbon mixtures
aerosol propellants
extraction grade hexane

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Introduction

This report has been prepared under the DEFRA research programme 'Emission Factors and Cost Curves for Air Pollutants' (reference EPG 1/3/134). This programme includes research aimed at improving the characterisation of emissions of non-methane volatile organic compounds (NMVOC) in the National Atmospheric Emissions Inventory (NAEI). An important element of this characterisation is an understanding of the chemical components which make up the emissions of NMVOC from each type of source. To fulfil this requirement the NAEI includes a series of NMVOC species profiles which describe the chemical components of emissions from each source. The profiles give a list of the species present in emissions, each with a percentage of total NMVOC emissions which is emitted as that species. A species profile might therefore look as follows:

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When the profile is applied to the NMVOC emission for the relevant source, the emissions of the individual species are obtained, the sum of these being equal to give the NMVOC emission. The species profiles are subject to varying degrees of uncertainty and are subject to an ongoing programme of improvement. This report documents improvements to the species profiles made as a result of research carried out on the aforementioned DEFRA research programme, presents the species profiles used in the 1999 and 2000 versions of the NAEI and makes recommendations for further work. This report supersedes earlier reports on speciation such as Marlowe *et al*, 1992; Rudd, 1995; Passant & Lymbridi, 1998; and Jenkin *et al*, 2000.

Section 2 of the report gives a brief description of the derivation of all species profiles contained in the NAEI speciation module. The profiles are grouped by SNAP code (at level 1) – this is simply a matter of convenience, since a few of the profiles are used for more than one NAEI source and more than one SNAP code. Section 3 gives details of how the profiles were applied in the 1999 NAEI, and how the 2000 NAEI will differ. This section indicates which SNAP level 3 codes are linked with each NAEI species profile. This may be a useful guide for the application of the profiles in other inventories.

Photochemical oxidant creation potentials (POCP) have been derived for each chemical species used in the database. Section 4 briefly describes the concept of photochemical oxidant creation potential and explains how these are derived.

Section 5 suggests where further work might bring the most significant improvements in the database.

Finally, the detailed species profiles and other data are given in a series of appendices.

Description of Species Profiles

The following sections describe the sources of species profiles used in the NAEI VOC speciation module. The actual profiles themselves are given in Appendix 1. The US EPA species manual is referred to frequently and is available as the 'Speciate' programme from the US EPA website at http://www.epa.gov/ttn/chief.

1.1 PUBLIC POWER (SNAP 1)

Profile No. 30: **'Electricity generation using coal'** – this profile is taken from the US EPA Species manual and is that for 'coal fired boiler – electricity generation' (US EPA profile No. 1178). The US EPA gives the profile a data quality rating of E, but does not give any details of the source of the data.

Profile No. 32: **'Electricity generation using gas'** – this profile is taken from the US EPA Species manual, and is that for 'Natural gas turbine' (US EPA profile No. 0007). The US EPA gives the profile a data quality rating of C. The profile has been developed from data based on GC/MS analysis of fuel combustion exhaust. It is unclear what size of gas turbine were sampled for this profile, and therefore it is also unclear just how relevant this profile is for gas turbines operated by the UK electricity supply industry.

1.2 RESIDENTIAL COMBUSTION (SNAP 2)

Profile No. 16: **'Domestic combustion of coal – old profile'** – this profile, used in the 1999 NAEI, is taken from Rudd, 1995. It was developed from data derived from measurements made by Coal Research Establishment (CRE) in 1992 (Keeling *et al*, 1992). However, no record was available of the calculations used to create the profile from the CRE data. Further data were also available from CRE (CRE, 1995). The profile was therefore recalculated (see profile No. 122)

Profile No. 122: **'Domestic combustion of coal – new profile'** – this profile, to be used in the 2000 NAEI, draws on measurements of emissions from domestic coal fires, carried out by the CRE in 1992 (Keeling *et al*, 1992) and 1995 (CRE, 1995).

Profile No. 18: **'Domestic combustion of solid smokeless fuel – old profile'** – this profile, used in the 1999 NAEI, is taken from Rudd, 1995. As with profile 16 it was based on the CRE data from 1992 and required updating. A revised profile has therefore been generated (see profile No. 123).

Profile No. 123 **'Domestic combustion of solid smokeless fuel – new profile'** – this profile, to be used in the 2000 NAEI, draws on measurements of emissions from domestic coal fires, carried out by the CRE in 1992 (Keeling *et al*, 1992) and 1995 (CRE, 1995).

Profile No. 36: **'Domestic combustion of gas'** – this profile is from a report (Veldt, 1991) by the Netherlands' Organisation for Applied Scientific Research (TNO) and is the profile given

for 'Stationary combustion, boilers, natural gas'. This profile may not be applicable to domestic gas combustion but currently no other data are available.

Profile No. 38: **'Domestic combustion of oil'** – this profile is from the TNO report (Veldt, 1991), and is the profile given for 'Stationary combustion, residential units, distillate oil/kerosene'.

Profile No. 102: **'Residential wood combustion – old profile'** – this profile is a composite of the US EPA profiles 1167 and 1084 (Residential wood combustion and residential wood combustion $C_1 - C_6$). Details of the exact methodology used to produce the composite are not available. This profile has been used in the 1999 NAEI, however new profiles for domestic, and industrial, wood combustion have been developed for use in the 2000 NAEI (see profile No 125 and profile No. 126).

Profile No. 125: **'Domestic wood combustion'** – this profile is based on US EPA profile No 1084 for 'residential wood combustion $C_1 - C_6$', however, an allowance has been made for higher molecular weight compounds. This has been done because it is likely that heavier compounds represent a significant proportion of emissions from wood combustion, and it is assumed that NAEI emission factors for wood combustion will include their contribution. Therefore, NAEI emission factors for emissions of 2 and 3 ring polyaromatic hydrocarbons (PAHs) during domestic wood combustion have been used to enlarge the US EPA profile to include these compounds as well. The larger 4 & 5 ring PAHs were not included since these are likely to be emitted mainly in the particulate phase and would probably not be detected during measurements of VOC emissions.

1.3 INDUSTRIAL COMBUSTION (SNAP 3)

Profile No. 33: **'Industrial combustion of coal'** – this profile is taken from the US EPA Species manual, and is the profile for 'Coal-fired boiler - industrial' (US EPA profile No. 1185). It is based on stack samples collected in Tedlar bags and analysed by GC, and the US EPA assign it a data quality rating of D.

Profile No. 35: **'Industrial combustion of gas'** – this profile is taken from the US EPA Species manual, and is the profile for 'External combustion boiler – natural gas' (US EPA profile No. 0003). It is based on a stack sample analysed by GC/MS, and the US EPA assigns to it a data quality rating of B.

Profile No. 34: **'Industrial combustion of oil (distillate oil)'** – this is taken from the US EPA Species manual, and is the profile for 'External combustion boiler – distillate oil' (US EPA profile no 0002). The US EPA gives the profile, which is based on a stack sample for residual oil analysed by GC/MS, a data quality rating of B. The confusion over fuel, with the profile title suggesting distillate oil and the profile description giving residual oil must be an error, and it is assumed that distillate oil is meant in both cases (the US EPA have another profile (US EPA profile No. 0001) for residual oil. For the 1999 NAEI this profile was used for industrial combustion of all types of oil. In the 2000 NAEI, it is recommended that this profile should be used for gas oil combustion only, with Profile No. 31 - 'Industrial combustion of oil (residual oil) used for industrial combustion of fuel oil.

Profile No. 31: **'Industrial combustion of oil (residual oil)'** – this profile is taken from the US EPA Species manual, and is the profile for 'External combustion boiler – residual oil' (US EPA profile No. 0001). The US EPA gives the profile, which is based on a stack sample analysed by GC/MS, a data quality rating of B. It is likely that the US EPA profile refers to industrial combustion plant rather than utility boilers, and so there is some doubt as to the relevance of this profile for the UK electricity supply industry.

Profile No. 87: **'External combustion boiler – coal slurry'** – this profile is taken from the US EPA Species manual, and is the profile for 'External combustion boiler – coal slurry fired' (US EPA profile No. 1085). The US EPA give the profile, which is based on one source test where data were obtained using GC, a data quality rating of C.

Profile No. 88: **'External combustion boiler - coke oven gas'** – this is taken from the US EPA Species manual, and is the profile for 'External combustion boiler – coke oven gas' (US EPA profile No. 0005). The profile is based on a stack sample analysed by GC/MS and the US EPA assigns it a data quality rating of B.

Profile No. 91: **'External combustion boiler - refinery gas'** – this is taken from the US EPA Species manual, and is the profile for 'External combustion boiler – refinery gas' (US EPA profile No. 0004). The profile is based on a stack sample analysed by GC/MS and the US EPA assigns it a data quality rating of C.

Profile No. 86: **'Coke oven blast furnace gas'** – this is taken from the US EPA Species manual, and is the profile for 'Coke Oven Blast Furnace Gas' (US EPA profile No. 0217). The profile is based on composite survey data and GC/MS analysis of sampling train catch, and the US EPA assign it a data quality rating of B. This profile is assumed to relate to burning of blast furnace gas in coke ovens but this has not been confirmed and the US EPA species manual does not elaborate.

Profile No. 83: **'By-product coke oven stack gas'** – this is taken from the US EPA Species manual, and is the profile for 'By Product Coke Oven Stack Gas' (US EPA profile No. 0011). It is given a data quality C by the US EPA, and is based on samples taken from two coke oven stacks and analysed by GC/MS. The profile is assumed to relate to the combustion of coke oven gas but this is not clear in the reference.

Profile No. 126: **'Industrial wood combustion'** – this profile has been developed in a similar way to that for domestic wood combustion (profile No. 125), except that NAEI emission factors for industrial wood combustion have been used instead of those for domestic wood combustion.

Profile No. 95: **'Internal combustion engine – natural gas'** – this profile is taken from the US EPA Species manual. It is a composite profile developed using samples taken from two reciprocating engines operating under normal conditions. Samples were analysed using both a FID/PID GC and the MBTH method.

1.4 INDUSTRIAL PROCESSES (SNAP 4)

Profile No. 20: **'Alcoholic beverages – fermentation'** – this profile is taken from the US EPA species manual and is the profile for 'fermentation processes' (US EPA profile No. 1188). This profile is based on GC analysis of samples from four fermentation units in a (US) whiskey distillery. The US EPA gives the profile a data quality rating of C.

Profile No. 19: **'Bread baking'** – this profile is based on information given in a US paper (Keller, 1978) which concludes that emissions from US baking processes contain 95% ethanol and 5% consisting of three unidentified species. The paper concluded that the unidentified species were low molecular weight and were probably oxygenated species such as aldehydes or alcohols. The unidentified part of the emissions have therefore been assumed to be 2.5% acetaldehyde (precursor to ethanol in fermentation reactions), and 2.5% unspeciated alcohols.

Profile No. 15: **'Chemical industry'** – the species profile for the chemical industry is based on data available from the Pollution Inventory (PI) and, in the case of processes located in Scotland, from the Scottish Environment Protection Agency (SEPA). No information has been obtained on species present in emissions from chemical processes in Northern Ireland. In both the PI and SEPA data sets, there are gaps in the information on the speciation of emissions. In some cases, emissions from a process are totally unspeciated in the PI/SEPA data, in which case emissions are treated as unspeciated in the NAEI species profiles. In other cases emissions from a given process are partially speciated, and in these cases the unspeciated part of the process' emissions are assumed to consist of the same species as the speciated part. Because PI data are available for the period 1994 onwards, species profiles have been calculated for each of these years. The profile developed from 1994 data is also used as a default profile for the period 1970 – 1993.

Profile No. 103: **'Cement industry'** – this profile is based on data from the PI for 1998 and 1999. A large part of the profile is unspeciated, reflecting the lack of species reported in the PI.

Profile No. 14: **'Oil refineries'** – this profile is based on data provided by UKPIA, data reported in the PI, and species profiles from the US EPA. Benzene figures are based on numbers provided by UKPIA for 1990 and 1995 and PI data for 1998 and 1999. The profile content for other VOC species is based on a composite profile derived by averaging the following US EPA profiles:

US EPA Profile Number	Description
0297	Fixed roof tank - crude oil refinery
1211	Refinery crude oil storage tanks
0031	Refinery fugitive emissions - covered drainage separation pits
0316	Pipe/valve flanges
0321	Pump seals - composite
2568	Refinery - Romeoville, Illinois, 1990
2459	Refinery - Chevron South - August 6-17, 1996

The first five US EPA profiles are given data quality ratings of C by the US EPA; no ratings have been given to the remaining two US EPA profiles.

Profile No. 74: **'Petroleum processes'** – this profile is based on data reported in the PI. Data are reported over the period 1994 – 1999, and have been used to calculate an average profile. In the case of benzene, the actual quantities reported for each year have been used to calculate a year-specific factor for benzene.

Profile No. 98: **'Open hearth furnace with oxygen lance'** – this profile is taken from the US EPA species manual and is the profile for 'Open Hearth Furnace With Oxygen Lance' (US EPA profile No. 0014). This profile is based on two samples taken at precipitator inlet & outlet and is given a C data quality rating by the US EPA. This profile was used in the 1999 NAEI for blast furnace emissions but application of the profile to this sector does not seem to be particularly appropriate because the open hearth furnace is a steel-making process, now entirely superseded by the basic oxygen process, rather than a pig iron production process. Therefore a new profile has been developed for blast furnace emissions (see Profile No. 135)

Profile No. 135: **'Blast furnaces'** – no suitable profile has been found in the literature for blast furnace emissions and so a species profile has been derived from data for other, broadly similar sources. The NAEI assumes that VOC emissions occur during blast furnace charging (83% of total) and during pig iron tapping (17% of total). The US EPA species manual does contain a profile (US EPA Profile No. 0012) for 'Blast furnace ore charging and agglomerate charging'. However, this suggests that all emissions are trimethylfluorosilane, but no information is given as to why this compound should be emitted. The profile is based on information published in 1978 and will be assumed to be no longer appropriate. Instead, it would seem probable that emissions during blast furnace charging would be similar to sinter plant off-gas, or blast furnace gas. The US EPA does include a profile for sinter plants (US EPA Profile No. 0013), although not one for blast furnace gas. No information is available on emissions from pig iron tapping and so these emissions must be treated as unspeciated. Profile No. 135 is therefore generated by combining the US EPA profile No. 0013 with unspeciated emissions (17% of total).

Profile No. 41: **'Coke ovens'** – This profile is taken from the CORINAIR/EMEP Emission Inventory Guidebook (Chapter B146, Section 9). No information is given as to the source of the data or the reliability. Due to an error in the generation of data for inclusion in the 1999 NAEI, emissions from coke and solid smokeless fuel manufacture were speciated using temporary profiles (Numbers 133 and 134 respectively) in order to produce the correct emission estimate for benzene. These temporary profiles will underestimate the contribution of other VOC species. The 2000 NAEI should revert to use of profile No. 41.

1.5 EXTRACTION, 1ST PROCESSING & DISTRIBUTION OF FOSSIL FUELS (SNAP 5)

Profile No. 13: **'Crude oil distribution'** – this profile is taken from the US EPA Species manual, and is the profile for 'Fixed roof tank – crude oil marine terminal' (US EPA Profile No. 0305). The US EPA assigns the profile, which is based on an engineering evaluation of literature data, a data quality rating of C.

Profile No. 12: **'Crude oil production'** – this profile is taken from the US EPA Species manual, and is the profile for 'Oil & gas production – fugitives – valves and fittings – liquid service' (US EPA profile No. 1011). This profile is given a D data quality rating by the US EPA, and is based on data developed for the API.

Profile No. 25: **'Gas leakage'** – this profile is based on speciated emissions data given in the 1991 NAEI report (Gilham *et al*, 1994), which unfortunately does not identify the source of the data. The 1999 NAEI includes an error in this profile, therefore a new, corrected, version of the profile (Profile No. 124) has been added to the module, and this should be used from the 2000 NAEI onwards.

Profile No. 70: **'Petrol distribution – leaded'** – this profile is based on measurements carried out as part of a previous DETR programme, reported in Rudd *et al*, 1997.

Profile No. 71: **'Petrol distribution – unleaded'** – this profile is based on measurements carried out as part of a previous DETR programme, reported in Rudd *et al*, 1997.

1.6 SOLVENTS (SNAP 6)

Profile No. 8: **'Agrochemicals'** – this profile is based on estimates of solvent consumption provided by the Solvent Industry Association (SIA) for four different years. Some assumptions have to be made about the exact nature of the solvents used, since the SIA estimates often only identify major classes of solvent such as aliphatic hydrocarbons, alcohols etc, rather than individual species. The assumptions, based on limited data from other sources, are as follows:

Aliphatic hydrocarbons	white spirit
Aromatic hydrocarbons	160-180°C aromatic hydrocarbons
Alcohols	ethanol, 1-propanol & 2-propanol
Ketones	acetone & 2-butanone
Esters	ethyl acetate
Glycol ethers/acetates	common glycol ethers/acetates (see below)

In the absence of any information on which glycol ethers are most commonly used, a list has been drawn up based on inclusion in a SIA guide to solvents. This gives 19 solvents in total which are listed in Appendix 2.

Profile No. 6: **'Adhesives'** – this profile is based on estimates of solvent consumption provided by the Solvent Industry Association (SIA). Some assumptions have to be made about the exact nature of the solvents used, since the SIA estimates often only identify major classes of solvent such as aliphatic hydrocarbons, alcohols etc, rather than individual species. The assumptions, based on limited data from other sources, are as follows:

Aliphatic hydrocarbons	SBP solvents
Aromatic hydrocarbons	toluene and solvent xylene
Alcohols	ethanol, 1-propanol & 2-propanol
Ketones	acetone, 2-butanone & 4-methyl-2-pentanone
Esters	ethyl acetate, butyl acetate
Glycol ethers/acetates	common glycol ethers/acetates (see below)
Chlorinated hydrocarbons	dichloromethane, trichloroethene, 1,1,1-trichloroethane

In the absence of any information on which glycol ethers are most commonly used, a list has been drawn up based on inclusion in a SIA guide to solvents. This gives 19 solvents in total which are listed in Appendix 2.

Profile No. 140: **'Aerosols'** – this profile is derived from information provided by the British Aerosol Manufacturers Association (BAMA) and by the SIA. In the 1999 NAEI, BAMA data for 1996 are used for the profile, however following a review of the available data and the provision of some new information by BAMA, a revised profile has been produced for use in the 2000 NAEI. The basis of the new profile is a series of estimates of solvents used in UK aerosols during 1991, 1996 & 1999, supplied by BAMA (Knollys, 1992, Rogers, 1997 & Jackson, 2001). These data are used to generate annual profiles for the period 1991 to 1999, although, generally, the types of solvents used in aerosols have not changed much with hydrocarbons and alcohols predominating. The main change is the phase out of the use of the solvent 1,1,1-trichloroethane.

Solvent type	1991	1996	1999
Hydrocarbon (solvent)	8%		6%
Hydrocarbon (propellant)	51%		44%
Hydrocarbons (total)		57%	
Dimethylether	2%	1%	3%
Alcohols	35%	35%	45%
Esters & ketones	1%		2%
1,1,1-trichloroethane	2%		
Other		7%	

The hydrocarbon propellants (which also function as solvents) are predominantly (99%) butane/propane mixtures with a small amount of pentane while higher molecular weight hydrocarbons such as white spirit are used as solvents. The butane/propane mixtures are assumed to be 85% butane and 15% propane, a split suggested by BAMA, although they recommend that this should be confirmed with propellant suppliers. Ethanol is known to be the main alcohol used in aerosols and is assumed to make up 80% of the total alcohol usage. From data supplied by the SIA it is apparent that propanols are also used and so the remaining 20% of alcohol use is assumed to be 1-propanol and 2-propanol. Of these two, 2-propanol is used much more commonly, and it is assumed that 15% of alcohol use is 2-propanol and 5% is 1-propanol. The category 'esters & ketones is assumed to be split equally between the two classes of compound, with acetone and 2-butanone making up the ketone component and ethyl acetate making up the ester component, based on data supplied by SIA. In the case of ketones, 2-butanone is used much more commonly than acetone and so a 75%/25% split is adopted for 2-butanone/acetone. The category 'other' in the 1996 survey is assumed to be esters, ketones, and 1,1,1-trichloroethane. Use of 1,1,1-trichloroethane had ended by 1999.

The old profile (Profile No 7) used similar assumptions to those listed above, but did not include pentane or 1,1,1-trichloroethane and was also based on the assumption that equal quantities of 1-propanol/2-propanol and acetone/2-butanone were used.

Profile No. 107: **'Carcare products'** – this profile is based on limited information contained in a survey of solvent emissions from consumer product use (Atlantic Consulting, 1995) carried

out as part of a previous DEFRA programme, complemented by US EPA data on the species present in various types of consumer products.

Profile No. 68: **'Cosmetics and toiletries'** – this profile is based on limited information contained in a survey of solvent emissions from consumer product use carried out as part of a previous DEFRA programme (Atlantic Consulting, 1995), complemented by US EPA data on the species present in various types of consumer products.

Profile No. 44: **'Decorative paint'** – this profile is based on information provided by the British Coatings Federation (BCF). This information (Smith, 1991) consisted of listings of solvents used in solventborne and waterborne coatings. In order to derive profiles, the following approach has been used:

- In the case of solventborne coatings, the BCF list major components and minor components but do not quantify the use of each solvent. In order to generate a profile we have assumed that the ratio of usage of major components to minor components is 4:1. The major components include four types of solvent which are all treated as white spirit for the purposes of speciation: these are high flash white spirit; white spirit; de-aromatised white spirit; Shellsol T.
- In the case of waterborne coatings, the BCF simply provide a list of solvents and each of these is assumed to be used in equal quantities.

Profile No. 55: **'Film coating'** – this profile is based on information collected from process operators or the regulators of these processes.

Profile No. 69: **'Household products'** – this profile is based on limited information contained in a survey of solvent emissions from consumer product use (Atlantic Consulting, 1995) carried out as part of a previous DEFRA programme, complemented by US EPA data on the species present in various types of consumer products.

Profile No. 4: **'Ink manufacture'** – this profile has been developed from information provided by the British Coatings Federation (BCF) on solvents present in different types of ink (Newbould, 1999). Because of differences in the market share of the different types of inks in each year, a separate profile has been compiled for each year.

Profile No. 10: **'Leather coating'** – this profile has been developed for use in the 2000 NAEI for the NAEI source 'leather coating'. Solvents used in leather coatings include aromatic and aliphatic hydrocarbons, alcohols, esters, ketones, glycols, and chlorinated hydrocarbons (Cornell *et al*, 1991). The profile is constucted by assuming that an equal quantity of each of these solvent types is used and that the solvents have fairly low boiling points due to the delicate nature of the substrate and presumably the need for drying at ambient or only slightly elevated temperatures. The following solvents are used in the profile:

Aliphatic hydrocarbons	SBP solvents
Aromatic hydrocarbons	toluene
Alcohols	2-propanol
Esters	ethyl acetate
Ketones	2-butanone
Glycols	2-ethoxyethanol
Chlorinated hydrocarbons	trichloroethene

Profile No. 106: **'Leather degreasing'** – this profile is based on information received from the British Leather Confederation (Sykes, 1992). The solvents used for degreasing were estimated to be equal quantities of chlorinated hydrocarbons and white spirit/kerosene. The chlorinated solvent is assumed to be 1,1,1-trichloroethane, since this solvent has been identified as a cleaning solvent for leather in a report on chlorinated solvent use (Coopers & Lybrand, 1990). The profile assumes emissions are 50% 1,1,1-trichloroethane and 50% white spirit. The assumption about 1,1,1-trichloroethane will need to be checked since the manufacture of this solvent has now been banned. Although it is possible that the industry uses recycled solvent, it is also possible that other solvents have been substituted.

Profile No. 11: **'Other solvent use'** – this profile is based on estimates of solvent consumption provided by the Solvent Industry Association (SIA). Some assumptions have to be made about the exact nature of the solvents used, since the SIA estimates often only identify major classes of solvent such as aliphatic hydrocarbons, alcohols etc, rather than individual species. The assumptions, based on limited data from other sources, are as follows:

Aromatic hydrocarbons	toluene & solvent xylene
Ketones	acetone, 2-butanone, 4-methyl-2-pentanone, other ketones
Esters	ethyl acetate & butyl acetate
Chlorinated hydrocarbons	dichloromethane, trichloroethene, tetrachloroethene, 1,1,1-trichloroethane

Profile No. 3: **'Paint manufacture'** – this profile is based on information provided by the BCF in 1990 (Newbould, 1990). This information consisted of listings of solvents used in each painting sector, together with an estimate of the usage of each class of solvent (e.g. aliphatic hydrocarbons, esters, chlorinated hydrocarbons etc.) as well as an indication of whether the usage of each individual solvent was significant or not. In order to convert this information into emission estimates for each individual species, it has been assumed that where use of a solvent is listed as significant in the BCF data, then the level of usage is four times higher than those solvents which are not significant. For example, the BCF have estimated that 400 tonnes of alcohols are used in marine paints as follows:

ethanol	not significant
i-butanol	not significant
n-butanol	significant

We have assumed the following usage of the individual alcohols:

ethanol	67 tonnes (i.e. 1/6th of the total)
i-butanol	67 tonnes (i.e. 1/6th of the total)
n-butanol	267 tonnes (i.e. 4/6ths of the total)

The BCF data contains reference to various mixtures, including white spirit, SBP solvent, solvent xylene, 160-180°C boiling point aromatic solvent and 180-220°C boiling point aromatic solvent, and Bisol K. The speciation used for these mixtures is given in Appendix 3.

The same methodology is also used for the following profiles:

Profile No. 48: **'Paint: coil coating'**
Profile No. 51: **'Paint: general industrial'**
Profile No. 50: **'Paint: heavy duty'**
Profile No. 49: **'Paint: marine'**
Profile No. 52: **'Paint: metal packaging'**
Profile No. 45: **'Paint: OEM'**
Profile No. 46: **'Paint: vehicle refinishing'**
Profile No. 47: **'Paint: wood coating'**

Profile No. 104: **'Paper coating'** – this profile is based on information collected from regulators of these processes.

Profile No. 105: **'Print chemicals'** – this profile includes 2-propanol only, as this source refers to the use of 2-propanol in fount solutions

Profile No. 60: **'Printing – heatset web offset'** – this profile is based on data provided by the BCF in 1999 (Newbould, 1999). They estimate that solvents used in this industry are high boiling naphthenic and petroleum distillates. A report by the European Confederation for Printing and Allied Industries (Intergraf / EGF, 1999) confirms this, stating that inks typically contain aromatic-free distillates with boiling point ranges of 240-270°C. No detailed profile was available for this type of solvent for the 1999 NAEI so, instead, the emissions are assumed to consist entirely of tetradecane. This has a boiling point of 254°C, and might be expected to be present in the type of distillate used in the industry (although branched chain molecules would presumably also be present). For the 2000 NAEI it would be more appropriate to use a profile for a typical high boiling point aliphatic hydrocarbon solvent such as Shellsol D100. A profile is available for Shellsol D70 – see Profile No. 139, and this might also be used, although this product has a lower boiling range than that given by the Intergraf/EGF report

Profile No. 56: **'Printing – flexography'** – this profile is based on the data provided by the BCF in 1999 (ibid). The BCF profiles include glycol ethers which are assumed to be made up of equal quantities of 1-methoxy-2-propanol and 1-ethoxy-2-propanol (these solvents are given as typical glycol ethers used in flexography inks in the Intergraf/EGF report (Intergraf / EGF, 1999)).

Profile No. 59: **'Printing – screen printing'** – this profile is based on the data provided by the BCF in 1999 (ibid). The BCF profiles include aromatic hydrocarbons, which are assumed to be equal quantities of toluene and solvent xylene, and glycol ethers, which are assumed to be equal quantities of 1-methoxy-2-propanol, 1-methoxy-2-propylacetate and 2-butoxyethanol which are given in the Intergraf/EGF report as solvents in screen inks.

Profile No. 57: **'Printing – flexography/non-publication gravure'** this profile is based on the data provided by the BCF in 1999 (ibid), however a number of assumptions have to be made. The BCF include estimates for low boiling aliphatic distillates and glycol ethers. No details are available on typical hydrocarbon solvents used in these inks and these are assumed to be SBP 65/70, although this has not been verified. The glycol ethers are assumed to be equal quantities of 1-methoxy-2-propanol and 1-ethoxy-2-propanol (these solvents are given as typical glycol ethers used in packaging inks by the Intergraf/EGF report).

Profile No. 73: **'Printing – publication gravure'** – this profile is based on the data provided by the BCF in 1999 (ibid), and assumes that the low boiling point aliphatic distillates mentioned by BCF is SBP 65/70.

Profile No. 136: **'Press washups'** – this profile has been developed for use in the 2000 NAEI for the NAEI sources 'printing – newspapers', 'printing – metal decorating', and 'printing – other offset'. The emissions from these sources are due to the use of washups. The Intergraf / EGF report (Intergraf / EGF, 1999) gives the following common types of washups:

- Aromatic free hydrocarbon mixtures with flash point of less than 21 degrees C
- Aromatic free hydrocarbon mixtures with flash point of more than 21 degrees C
- Aromatic free hydrocarbon mixtures with flash point of more than 55 degrees C
- High boilers, with flash point of more than 100 degrees C
- Vegetable oil esters, with a flash point of more than 150 degrees C

The last three are assumed to be sufficiently involatile so as not to contribute to emissions, with the cleaning agent being recovered for disposal as waste. The first two can be treated as SBP solvent and white spirit respectively and so a profile has been developed which is the mean of these two profiles (see Appendix 3 for details of these profiles).

Profile No. 138: **'Printing – overprint varnishes'** – this profile has been developed for use in the 2000 NAEI for the NAEI source 'printing – overprint varnishes'. The solvents used in overprint varnishes are low boiling point solvents including aliphatic and aromatic hydrocarbons, ketones, alcohols, and glycols (CITEPA, 1990). In the absence of any further data the following solvents, chosen because they are used quite commonly in other sectors, are assumed to be used in equal quantities:

Aliphatic hydrocarbons	SBP solvents
Aromatic hydrocarbons	toluene
Ketones	2-butanone
Alcohols	2-propanol
Glycols	2-ethoxyethanol

Profile No. 53: **'Rubber processes'** - this profile is based on estimates of solvent consumption provided by the Solvent Industry Association (SIA). Some assumptions have to be made about the exact nature of the solvents used, since the SIA estimates often only identify major classes of solvent such as aliphatic hydrocarbons, alcohols etc, rather than individual species. The assumptions are as follows, based on limited data other sources:

Aliphatic hydrocarbons	SBP solvents
Aromatic hydrocarbons	toluene & solvent xylene
Alcohols	1-propanol & 2-propanol
Ketones	acetone & 4-methyl-2-pentanone
Chlorinated hydrocarbons	dichloromethane

Profile No. 9: **'Seed oil extraction'** – Hexane solvent is used by the seed oil extraction processes included in this NAEI source. For the 1999 NAEI the profile assumes that all of this solvent is hexane. In reality, it is likely that the commercial grades of hexane used contain other components such as isoalkanes and cycloalkanes and a profile is needed. As a default it might be

assumed that extraction grade hexane contains 50% n-hexane and 50% other hexane isomers (based on a data sheet for extraction grade hexane available from a major solvent supplier).

Profile No. 62: **'Solvent use – 1,1,1 trichloroethane'** – this profile is used for sources such as 'surface cleaning' where 1,1,1-trichloroethane is the only solvent used. The profile consists solely of that solvent.

Profile No. 65: **'Solvent use – dichloromethane'** – this profile is used for sources such as 'surface cleaning' where dichloromethane is the only solvent used. The profile consists solely of that solvent.

Profile No. 64: **'Solvent use – tetrachloroethene'** – this profile is used for sources such as 'surface cleaning' and 'dry cleaning' where tetrachloroethene is the only solvent used. The profile consists solely of that solvent.

Profile No. 63: **'Solvent use – trichloroethene'** – this profile is used for sources such as 'surface cleaning' where trichloroethene is the only solvent used. The profile consists solely of that solvent.

Profile No. 66: **'Solvent use – white spirit'** – this profile is used for sources such as 'surface cleaning' where white spirit is the only solvent used. The profile consists solely of that solvent.

Profile No. 139: **'Solvent use – Shellsol D70'** – this profile is based on data received from a solvent supplier and could be used as a typical profile for high boiling aliphatic hydrocarbon solvents.

Profile No. 67: **'Surface cleaning – other solvents'** this profile is based on information provided by the SIA. Common solvents used in this sector are include propanol, acetone and 2-butanone. In the absence of more detailed information, equal quantities of each solvent are assumed to be used.

Profile No. 54: **'Textile coating'** – This profile is based on information collected from regulators of these processes.

Profile No. 43: **'Wood impregnation'** – this profile is based on estimates of solvent consumption provided by the Solvent Industry Association (SIA). Some assumptions have to be made about the exact nature of the solvents used, since the SIA estimates often only identify major classes of solvent such as aliphatic hydrocarbons, alcohols etc, rather than individual species. The assumptions are as follows:

Aliphatic hydrocarbons	white spirit
Aromatic hydrocarbons	toluene & solvent xylene
Alcohols	1-butanol & 2-butanol
Ketones	acetone, 2-butanone, 4-methyl-2-pentanone & 4-methyl-4-hydroxy-2-pentanone
Esters	ethyl acetate, 2-propyl acetate & butyl acetate
Glycol ethers/acetates	common glycol ethers/acetates (see below)

In the absence of any information on which glycol ethers are most commonly used, a list has been drawn up based on inclusion in a SIA guide to solvents. This gives 19 solvents in total which are listed in Appendix 2.

1.7 TRANSPORT (SNAP 7-8)

Profile No. 40: **'2-Stroke petrol engines'** – this profile is that given in the CORINAIR / EMEP Emission Inventory Guidebook for 2-stroke engines (see Section B710). The original source of the data is given as Loibl *et al*, 1993.

Profile No. 75: **'Aircraft landing/takeoff (LTO) – commercial'** – this profile is that for emissions from commercial aircraft jet engines based on an average LTO cycle, given in the US EPA Species manual (US EPA profile no 1098). The US EPA assigns this profile a data quality rating of B.

Profile No. 128: **'Aircraft (TOL)'** – this profile was based on data given in the EMEP/CORINAIR Emission Inventory Guidebook but contained an error. It has been replaced by Profile No. 75 in the 2000 NAEI.

Profile No. 77: **'Aircraft landing/takeoff (LTO) – military'** – this profile is that for emissions from military aircraft jet engines based on an average LTO cycle, given in the US EPA Species manual (US EPA profile no 1097). The US EPA assigns this profile a data quality rating of B.

Profile No. 108: **'Road transport, petrol, conventional'** – this profile is taken from version 2.1 of the methodology and emission factor manual for COPERT III.

Profile No. 109: **'Road transport, petrol, catalysts'** – this profile is taken from version 2.1 of the methodology and emission factor manual for COPERT III

Profile No. 110: **'Road transport, derv, light duty'** – this profile is taken from version 2.1 of the methodology and emission factor manual for COPERT III

Profile No. 111: **'Road transport, derv, heavy duty'** – this profile is taken from version 2.1 of the methodology and emission factor manual for COPERT III

Profile No. 112: **'Road transport, LPG'** – this profile is taken from version 2.1 of the methodology and emission factor manual for COPERT III

Profile No. 113: **'Road transport, petrol, evaporative'** – this profile is taken from version 2.1 of the methodology and emission factor manual for COPERT III

Profile No. 114: **'Shipping'** – this profile is taken from the CORINAIR Guidebook (section B864) which in turn is taken from Cooper *et al,* 1996 and is based on measurement of hydrocarbon emissions from two ferries, one burning gas oil, the other fuel oil.

1.8 WASTE DISPOSAL AND TREATMENT (SNAP 9)

Profile No. 94: **'Flares – Natural Gas'** – this profile is taken from the US EPA species manual (US EPA profile No. 0051). It is based on an engineering assessment of literature data, and is given a D data quality rating by the US EPA.

Profile No. 22: **'Landfill'** – this profile has been developed from data given in the Department of the Environment Waste Management Paper No 26 (DoE, 1986).

Profile No. 115: **'Waste incineration'** – This profile is taken from the US EPA species manual (US EPA profile No. 0122). The profile is based on composite survey data and GC/MS analysis of a grab sample and is given a D data quality rating by the US EPA.

1.9 NATURAL SOURCES (SNAP 11)

Profile No. 42: **'Forests'** – this profile is not fully speciated – instead emissions are reported as the partially speciated group 'isoprene and other biogenic VOC'.

Use of Species Profiles in the NAEI

1.10 MAPPING OF SPECIES PROFILES TO NAEI SOURCES

The 1999 NAEI included VOC emission estimates for 295 different sources, and used 86 of the species profiles contained in the speciation module. Table 3.1 shows which profile was used for each source. SNAP codes are also included – these have been used in the generation of composite profiles for individual SNAP codes (Appendix 4). The table also shows where changes are recommended for the 2000 NAEI.

Table 3.1 Mapping of species profiles to NAEI sources.

SNAP	source	Fuel (where applicable)	Profile	
			1999	2000
020300	Agriculture	Straw	2	
040607	Brewing: barley malting		2	
040607	Brewing: wort boiling		2	
100301	Field burning		2	
090901	Cremation		2	
090201	MSW incineration		2	115
090205	Sewage sludge incineration		2	
040207	Electric arc furnaces		2	
060313	Leather coating		2	10
020105	Miscellaneous combustion	Landfill gas	2	95
050202	Offshore oil & gas (venting)		2	12
050202	Offshore oil & gas (well testing)		2	94
040605	Other food: animal feed manufacture		2	
040605	Other food: cakes, biscuits and cereals		2	
040605	Other food: coffee roasting		2	
040605	Other food: margarine and other solid fats		2	
040605	Other food: meat, fish & poultry		2	
040605	Other food: sugar production		2	
010100	Power stations	Poultry litter	2	
010102	Power stations	MSW	2	115
010105	Power stations	Sewage gas	2	95
010105	Power stations	Landfill gas	2	95
060403	Printing (metal decorating)		2	60
060403	Printing (newspapers)		2	136
060403	Printing (other offset)		2	136
060403	Printing (overprint varnishes)		2	138
020105	Public services	Sewage gas	2	95
040208	Rolling mills: cold rolling		2	
040208	Rolling mills: hot rolling		2	
040522	Ship purging		2	141
040608	Spirit manufacture: barley malting		2	
040608	Spirit manufacture: spent grain drying		2	

SNAP	source	Fuel (where applicable)	Profile	
			1999	2000
060307	Coating manufacture (paint)		3	
060308	Coating manufacture (ink)		4	
060309	Coating manufacture (glue)		6	
060405	Industrial adhesives		6	
060408	Domestic adhesives & sealants		6	
060408	Aerosols (car-care products)		7	140
060408	Aerosols (cosmetics and toiletries)		7	140
060408	Aerosols (household products)		7	140
060412	Agrochemicals use		8	
060404	Seed oil extraction		9	
060412	Other solvent use		11	
050200	Offshore oil & gas (other)		12	
050202	Offshore loading		13	
050401	Oil terminal storage		13	
050401	Onshore loading		13	
040101	Refineries (drainage)		14	
040101	Refineries (process)		14	
040104	Refineries (tankage)		14	
040500	Chemical industry		15	
020200	Domestic	Coal	16	122
020200	Domestic	Anthracite	16	123
020200	Domestic	Coke	16	123
020200	Domestic	Solid smokeless fuels	18	123
020100	Miscellaneous combustion	Solid smokeless fuels	18	123
030100	Other industrial combustion	Solid smokeless fuels	18	123
040605	Bread baking		19	
040607	Brewing: fermentation		20	
040607	Cider manufacture		20	
040608	Spirit manufacture: casking		20	
040608	Spirit manufacture: distillation		20	
040608	Spirit manufacture: fermentation		20	
040608	Spirit manufacture: maturation		20	
040606	Wine manufacture		20	
090401	Landfill		22	
050603	Gas leakage		25	124
080402	Coastal shipping	Fuel oil	26	114
080403	Fishing vessels	Fuel oil	26	114
080600	Agricultural power units	Petrol	27	108
080800	Other industrial off-road vehicles	Petrol	27	108
020300	Agriculture	Gas oil	28	34
080600	Agricultural power units	Gas oil	28	111
081000	Aircraft support vehicles	Gas oil	28	111
080402	Coastal shipping	Gas oil	28	114
080900	House & garden machinery	DERV	28	110
080403	Fishing vessels	Gas oil	28	114
080800	Other industrial off-road vehicles	Gas oil	28	111
080203	Railways	Gas oil	28	111
080100	Naval shipping	Gas oil	28	114
030100	Autogenerators	Coal	30	
010101	Power stations	Coal	30	

SNAP	source	Fuel (where applicable)	Profile	
			1999	2000
010101	Power stations	Coke	30	
010101	Power stations	Fuel oil	31	
010102	Power stations	Gas oil	31	34
010101	Power stations	Orimulsion	31	
030100	Autogenerators	Natural gas	32	
010104	Power stations	Natural gas	32	
010101	Power stations	Sour gas	32	
010100	Power stations	LPG	32	
020300	Agriculture	Coal	33	
020300	Agriculture	Coke	33	
010500	Collieries	Coal	33	
030100	Iron and steel combustion	Coal	33	
030100	Iron and steel combustion	Coke	33	
030301	Iron and steel (Sinter plant)	Coke	33	
020100	Miscellaneous combustion	Coal	33	
020100	Miscellaneous combustion	Coke	33	
030100	Other industrial combustion	Coal	33	
030100	Other industrial combustion	Petroleum coke	33	
030100	Other industrial combustion	Coke	33	
020100	Public services	Coal	33	
020100	Public services	Coke	33	
020100	Railways (stationary sources)	Coal	33	
020100	Railways (stationary sources)	Coke	33	
010300	Refineries (combustion)	Petroleum coke	33	
010400	SSF production	Coke	33	
010400	Town gas production	Coal	33	
010400	Town gas production	Coke	33	
020300	Agriculture	Burning oil	34	
020300	Agriculture	Fuel oil	34	31
020300	Agriculture	Vaporising oil	34	
030100	Iron and steel combustion	Fuel oil	34	31
030100	Iron and steel combustion	Gas oil	34	
020100	Miscellaneous combustion	Fuel oil	34	31
020100	Miscellaneous combustion	Gas oil	34	
030100	Other industrial combustion	Burning oil	34	
030100	Other industrial combustion	Fuel oil	34	31
030100	Other industrial combustion	Gas oil	34	
030100	Other industrial combustion	Lubricants	34	31
020100	Public services	Burning oil	34	
020100	Public services	Fuel oil	34	31
020100	Public services	Gas oil	34	
020100	Railways (stationary sources)	Burning oil	34	
020100	Railways (stationary sources)	Fuel oil	34	31
010300	Refineries (combustion)	Fuel oil	34	31
010300	Refineries (combustion)	Gas oil	34	
010300	Refineries (combustion)	Petrol	34	
010400	Town gas production	Burning oil	34	
020300	Agriculture	Natural gas	35	
030205	Ammonia combustion	Natural gas	35	
010406	Coke production	Natural gas	35	

SNAP	source	Fuel (where applicable)	Profile	
			1999	2000
010406	Coke production	Colliery methane	35	
010500	Collieries	Natural gas	35	
010500	Collieries	Colliery methane	35	
010500	Gas production	Natural gas	35	
010500	Gas production	Colliery methane	35	
010500	Gas production	Town gas	35	
010500	Gas production	LPG	35	
010500	Gas separation plant (combustion)	LPG	35	
030203	Iron and steel (blast furnaces)	Natural gas	35	
030203	Iron and steel (blast furnaces)	Blast furnace gas	35	
030203	Iron and steel (blast furnaces)	Coke oven gas	35	88
030100	Iron and steel (combustion)	Natural gas	35	
030100	Iron and steel (combustion)	Town gas	35	
030100	Iron and steel (combustion)	LPG	35	
020100	Miscellaneous combustion	Natural gas	35	
020100	Miscellaneous combustion	Town gas	35	
010400	Nuclear fuel production	Natural gas	35	
010500	Offshore oil industry combustion	Natural gas	35	
030100	Other industrial combustion	Natural gas	35	
030100	Other industrial combustion	Town gas	35	
030100	Other industrial combustion	Colliery methane	35	
030100	Other industrial combustion	LPG	35	
020100	Public services	Natural gas	35	
020100	Public services	Town gas	35	
020100	Railways (stationary sources)	Natural gas	35	
010300	Refineries (combustion)	Natural gas	35	
010300	Refineries (combustion)	LPG	35	
010400	SSF production	Natural gas	35	
010400	Town gas production	Natural gas	35	
010400	Town gas production	LPG	35	
020200	Domestic combustion	Natural gas	36	
020200	Domestic combustion	Town gas	36	
020200	Domestic combustion	LPG	36	
020200	Domestic combustion	Burning oil	38	
020200	Domestic combustion	Fuel oil	38	
020200	Domestic combustion	Gas oil	38	
080100	Military aircraft	Aviation turbine fuel	39	77
080900	House & garden machinery	Petrol	40	
070600	Motorcycles (evaporative losses)	Petrol	40	113
110000	Forests		42	
060406	Wood impregnation		43	
060103	Decorative paint (retail decorative)		44	
060104	Decorative paint (trade decorative)		44	
060101	Industrial coatings (automotive)		45	
060102	Industrial coatings (commercial vehicles)		46	
060102	Industrial coatings (vehicle refinishing)		46	
060107	Industrial coatings (wood)		47	
060105	Industrial coatings (coil coating)		48	
060106	Industrial coatings (marine)		49	
060109	Industrial coatings (high performance)		50	

SNAP	source	Fuel (where applicable)	Profile	
			1999	2000
060108	Industrial coatings (agricultural & construction)		51	
060108	Industrial coatings (aircraft)		51	
060108	Industrial coatings (drum)		51	
060108	Industrial coatings (metal and plastic)		51	
060108	Industrial coatings (metal packaging)		52	
060305	Other rubber products		53	
060305	Tyre manufacture		53	
060312	Textile coating		54	
060311	Film coating		55	
060403	Printing (other flexography)		56	
060403	Printing (flexible packaging)		57	
060403	Printing (screen printing)		59	
060403	Printing (heatset web offset)		60	
060201	Surface cleaning (1,1,1-trichloroethane)		62	
060201	Surface cleaning (trichloroethylene)		63	
060202	Dry cleaning		64	
060201	Surface cleaning (tetrachloroethylene)		64	
060201	Surface cleaning (dichloromethane)		65	
060408	non-aerosol products (paint thinner/remover)		66	
060403	Paper coating		66	104
040611	Road construction		66	
060201	Surface cleaning (hydrocarbons)		66	
060201	Surface cleaning (other)		67	
060408	non-aerosol products (cosmetics and toiletries)		68	
060408	non-aerosol products (household products)		69	
050503	Petrol stations (petrol delivery)	Petrol (leaded)	70	
050503	Petrol stations (spillages)	Petrol (leaded)	70	
050503	Petrol stations (storage tanks)	Petrol (leaded)	70	
050503	Petrol stations (vehicle refuelling)	Petrol (leaded)	70	
050502	Petrol terminals (storage)	Petrol (leaded)	70	
050502	Petrol terminals (tanker loading)	Petrol (leaded)	70	
050501	Refineries (road/rail loading)	Petrol (leaded)	70	
050503	Petrol stations (petrol delivery)	Petrol (unleaded)	71	
050503	Petrol stations (spillages)	Petrol (unleaded)	71	
050503	Petrol stations (storage tanks)	Petrol (unleaded)	71	
050503	Petrol stations (vehicle refuelling)	Petrol (unleaded)	71	
050502	Petrol terminals (storage)	Petrol (unleaded)	71	
050502	Petrol terminals (tanker loading)	Petrol (unleaded)	71	
050501	Refineries (road/rail loading)	Petrol (unleaded)	71	
060403	Printing (publication gravure)		73	
050201	Petroleum processes		74	
010406	Coke production	Coke oven gas	83	
010406	Coke production	Blast furnace gas	86	
030100	Iron and steel (combustion)	Blast furnace gas	86	
040202	Iron and steel (flaring)	Blast furnace gas	86	
010100	Power stations	Slurry	87	
010500	Collieries	Coke oven gas	88	
030100	Iron and steel (combustion)	Coke oven gas	88	
040201	Iron and steel (flaring)	Coke oven gas	88	
030100	Other industrial combustion	Coke oven gas	88	

SNAP	source	Fuel (where applicable)	Profile	
			1999	2000
010400	Town gas production	Coke oven gas	88	
010500	Gas production	OPG	91	
010500	Gas separation plant (combustion)	OPG	91	
030100	Other industrial combustion	OPG	91	
010102	Power stations	OPG	91	
010300	Refineries (combustion)	Naphtha	91	
010300	Refineries (combustion)	Miscellaneous	91	
010300	Refineries (combustion)	OPG	91	
090206	Offshore oil & gas (flaring)		94	
090203	Refineries (flares)		94	
040202	Iron and steel (blast furnaces)		98	135
020200	Domestic combustion	Wood	102	125
030100	Other industrial combustion	Wood	102	126
030311	Cement production		103	
060403	Printing (print chemicals)		105	
060313	Leather degreasing		106	
060408	Non-aerosol products (automotive products)		107	
070501	Motorcycles (exhausts) – motorway driving	Petrol	108	
070502	Motorcycles (exhausts) – urban driving	Petrol	108	
070503	Motorcycles (exhausts) – rural driving	Petrol	108	
070400	Mopeds (exhausts)	Petrol	108	
070101	Non-catalyst cars (exhausts) – motorway driving	Petrol	108	
070102	Non-catalyst cars (exhausts) – rural driving	Petrol	108	
070103	Non-catalyst cars (exhausts) – urban driving	Petrol	108	
070103	Non-catalyst cars (exhausts) – cold start	Petrol	108	
070201	Non-catalyst LGVs (exhausts) – motorway driving	Petrol	108	
070202	Non-catalyst LGVs (exhausts) – rural driving	Petrol	108	
070203	Non-catalyst LGVs (exhausts) – urban driving	Petrol	108	
070203	Non-catalyst LGVs (exhausts) – cold start	Petrol	108	
070201	Catalyst LGVs (exhausts) – motorway driving	Petrol	109	
070202	Catalyst LGVs (exhausts) – rural driving	Petrol	109	
070203	Catalyst LGVs (exhausts) – urban driving	Petrol	109	
070203	Catalyst LGVs (exhausts) – cold start	Petrol	109	
070101	Cars – motorway driving	DERV	110	
070102	Cars – rural driving	DERV	110	
070103	Cars – urban driving	DERV	110	
070103	Cars – cold start	DERV	110	
070201	LGVs – motorway driving	DERV	110	
070202	LGVs – rural driving	DERV	110	
070203	LGVs – urban driving	DERV	110	
070203	LGVs – cold start	DERV	110	
070301	Coaches – motorway driving	DERV	111	
070302	Coaches – rural driving	DERV	111	
070303	Buses – urban driving	DERV	111	
070301	Articulated HGVs – motorway driving	DERV	111	
070302	Articulated HGVs – rural driving	DERV	111	
070303	Articulated HGVs – urban driving	DERV	111	
070301	Rigid HGVs – motorway driving	DERV	111	
070302	Rigid HGVs – rural driving	DERV	111	
070303	Rigid HGVs – urban driving	DERV	111	

SNAP	source	Fuel (where applicable)	Profile	
			1999	2000
070600	Catalyst cars (evaporative)	Petrol	113	
070600	Non-catalyst cars (evaporative)	Petrol	113	
070600	Catalyst LGVs (evaporative)	Petrol	113	
070600	Non-catalyst LGVs (evaporative)	Petrol	113	
050302	Gasification processes		127	
080501	Aircraft (domestic)	Aviation turbine fuel	128	75
080502	Aircraft (international)	Aviation turbine fuel	128	75
070101	Catalyst cars (exhausts) – urban driving	Petrol	129	
070103	Catalyst cars (exhausts) – motorway driving	Petrol	130	
070102	Catalyst cars (exhausts) – rural driving	Petrol	131	
070103	Catalyst cars (exhausts) – cold start emissions	Petrol	132	
040201	Coke production		133	41
040204	SSF production		134	41

1.11 UNCERTAINTY IN THE NAEI SPECIATED INVENTORY

The NAEI speciated inventory has been developed over the past ten years and considerable effort has gone into producing species profiles. Many branches of industry have contributed data through their trade associations, and information has also been received directly from process operators and regulators (Local Authorities, the Environment Agency, and the Scottish Environment Protection Agency). As a result, we believe that the speciated inventory is now fairly robust, certainly as far as identifying which of the families of organic species (e.g. alkanes, alcohols, ketones etc.) are emitted by each process, and accurately identifying the major species emitted. The main area of uncertainty in the speciated inventory is likely to be in the detailed information – whether the contributions assumed for each species in a given profile are accurate, and whether minor components have been identified.

Broadly, there are four factors leading to uncertainty/error in the speciated inventory:

1) some minor emission sources do not have species profiles and therefore the emission is treated as unspeciated;
2) some emission sources are speciated with species profiles which contain an unspeciated component;
3) some emission sources are speciated using species profiles which have been 'borrowed' from a different emission source on the basis of an assumption that the characteristics of emissions from both sources will be very similar. In some or all cases this assumption may be wrong;
4) some emission sources are speciated using species profiles which are assumed to be realistic for that source, but which are not accurate. An example of this might be where a source is speciated using a profile based on measurements of a different source which is assumed to have the same species profile.

About 10% of the VOC sources identified in the NAEI do not have species profiles and are treated as wholly unspeciated. The emissions from these sources are all quite small, only contributing 3% of national VOC emissions in 1999. As shown in Table 3.1, species profiles will be available in the database for some of these sources in time for the 2000 NAEI, and this will reduce the contribution of wholly unspeciated sources to less than 2% of national emissions.

Of the remaining sources, the following would be priorities for development of a species profile:

Other food: animal feed manufacture
Other food: margarine and other solid fats
Brewing: barley malting
Spirit manufacture: barley malting

Speciation of these four sources would leave only about 0.5% of the emission from sources which are wholly unspeciated. However, it is unlikely that accurate profiles could be developed for these sources without new research involving sampling and analysis of emissions from UK processes. Emissions from these food industry processes would also be very complex and might also be very variable between one process and another, and so the development of profiles would require testing of more than one source. It is possible that a cheap compromise might be to develop a default profile for these sources, based on what literature studies exist and the judgement of the inventory team and other experts rather than on new measurements. In the case of barley malting, measurements to identify odorous components of barley roasting emissions were carried out at Warren Spring Laboratory in the 1970s and the results of that work might be useful.

Most of the species profiles included in the speciation module include the category 'unspeciated' as well as other partially speciated categories such as 'unspeciated alcohols' or 'C_8 aromatic hydrocarbons'. The 'unspeciated' component of these profiles is about 1% of national VOC emissions. The other, partially speciated, categories represent 6% of the national total. In general, the presence of 'unspeciated' or the various partially speciated categories in a profile occurs because the profile is based on obtained by analysis of emissions. These analyses usually do not identify all species present, either because species are present at low concentration, or because of limitations in the analytical technique. Many of the analyses used in the species profiles will be quite old (anything up to 25 years old), however it is debatable whether modern analytical technology would perform significantly better. In addition, in most profiles the percentage of the emission that is unspeciated or partially speciated is low and so any improvement in accuracy by repeating measurements would be unlikely to justify the expense. One exception to this is the profile for 2-stroke petrol engines which is used for house and garden machinery - almost 90% of the profile is unspeciated or partially speciated.

The impact of the third factor relating to uncertainties/errors introduced due to the use of 'borrowed' is hard to quantify since measurements would be needed to verify the assumptions made. The following are examples where profiles developed for one source have been used for a different source:

- Emissions from industrial combustion of coke are speciated using profiles relating to industrial combustion of coal.
- Emissions from combustion of LPG are speciated using profiles relating to combustion of natural gas
- Emissions from blast furnaces are speciated using a profile which relates to emissions from open hearth steel plant (this profile is being replaced in the 2000 NAEI by one which is more appropriate for the sector)
- Emissions from combustion of waste oils are speciated using a profile for industrial combustion of distillate oil.

- Emissions from combustion of petroleum coke are speciated using profiles for combustion of coal
- Emissions from combustion of Orimulsion by power stations are speciated using a profile for industrial combustion of residual oil.
- Emissions from combustion of naphtha and miscellaneous petroleum products at refineries are speciated using a profile relating to combustion of refinery gases. Similarly, emissions from combustion of petrol at refineries is speciated using a profile relating to combustion of distillate oil.

Emissions from all of the sources mentioned above are small and altogether, these sources contributed less than 0.1% of the national VOC total in 1999. The development of more appropriate species profiles is not, therefore, a priority.

The final area of uncertainty/error in the species module is probably the most important. The majority of significant VOC sources are speciated using profiles which were developed specifically for those sources, and which separate almost all of the emission into individual species. However, quite a number of these profiles are of low quality and, ideally, further research is needed to improve them. There are six main areas of concern

- profiles for stationary combustion, especially with regard to benzene;
- the profile for the chemical industry;
- profiles for the petroleum industry processes from oil exploration and production through to refining;
- profiles for a small number of solvent-using processes, especially with regard to reflecting changes in formulations in the profiles;
- the profile for forests;
- treatment of emissions that have been abated using destruction techniques.

A number of species profiles are available for stationary combustion sources, covering a range of both fuel types and scale of combustion. Although stationary combustion sources are not very important sources of VOC emissions, they are potentially important sources of benzene and it is important that the species profiles are accurate with respect to this pollutant. Table 3.2 shows the benzene fraction in the most important profiles.

Table 3.2 Benzene fractions of selected profiles for stationary combustion.

Profile No.	Source	% benzene
122	Domestic combustion of coal (new profile)	4.4%
123	Domestic combustion of solid smokeless fuel (new profile)	4.4%
125	Domestic wood combustion (new profile)	29.5%
38	Domestic combustion of oil	5.0%
36	Domestic combustion of gas	9.0%
33	Industrial combustion of coal	3.8%
126	Industrial wood combustion (new profile)	30.7%
34	Industrial combustion of oil (distillate oil)	nil
31	Industrial combustion of oil (residual oil)	nil
35	Industrial combustion of gas	9.1%
30	Electricity generation using coal	nil

32	Electricity generation using gas	nil
95	Internal combustion engine - natural gas	0.5%

The proportion of benzene in the various profiles varies considerably. The profiles for wood combustion processes contain the highest proportion of benzene, while the profiles for coal and gas fired power stations and oil fired industrial plant do not contain any benzene at all. While it is to be expected that the proportion of benzene in emissions would vary depending upon the fuel burnt and the scale of combustion, it seems unlikely that some combustion processes do not emit benzene at all when similar profiles emit significant quantities (e.g. compare profile 35 with 32, or profile 30 with 33). It is recommended that a judgement be made as to whether differences in benzene levels between these profiles are likely to be reasonable. If appropriate, further measurements could be considered, however there are practical difficulties associated with analysis of organic compounds present at low levels in exhaust gases from combustion gases (for example due to the high moisture content). An alternative approach might be to develop a small number of profiles based on expert judgement.

The profile for the chemical industry relies on a lot of assumptions, necessary because of the large quantity of emissions reported in the Pollution Inventory that are not speciated. The current approach involves filling in these gaps using those emissions that are reported as species as a guide. This method could be improved upon, either by obtaining fully speciated emissions for each process, or by gathering more data on each processes carried out at each plant so that the species emitted could be estimated accurately.

Profiles for oil production and oil distribution are surprisingly simple – for example the profile for crude oil distribution only contains the straight-chain alkanes from ethane to octane. Although this may be accurate, it is recommended that it should be tested, either through consultation with industry or through measurements. A further concern is that the profiles for oil production, oil distribution and refineries are all based on US data, whereas the species emitted from UK sources handling North Sea crude may be very different.

Profiles for solvent using processes are generally considered to be reasonable, although many assumptions have been made which should be verified. The methodology does need, therefore, to be scrutinised by industry representatives. One potential problem with the solvent industry species profiles which has yet to be fully addressed is reformulation – i.e. the likelihood that the profile has changed with time and will continue to change with time as a result of reformulation of solvent containing products. This issue is likely to be most significant for those sectors where regulations encourage reformulation – for example decorative paints, industrial coating (particularly metal and plastic, OEM, wood, and vehicle refinishing coatings), industrial adhesives, and coatings for paper, textiles, and leather. These profiles will need to be revised periodically to reflect changes in the technology employed.

Emissions from forests are currently treated as 'isoprene and other biogenic VOC'. No attempt has been made to identify emissions of individual species and indeed this might be a difficult exercise, requiring consideration of variations in the species emitted at different periods of the year, and differences in species emitted by different plant species among other things.

Emissions from processes that are abated using destruction technologies e.g. thermal or biological oxidation are assumed to have the same species profile as unabated emissions from the same processes. In other words, although the abatement will significantly reduce the emissions

from the process, it is assumed not to change the chemicals present in the emission. This is actually not very likely since at least some of the organic content within abated emissions will be partially oxidised species. At present, the fact that this issue is not considered is probably not important – emissions from processes abated in this way are a very small component of the national total. Increasingly, as more processes use this type of abatement system, it might be necessary to develop a suitable species profile.

Photochemical Oxidant Creation Potentials

1.12 INTRODUCTION

The species profiles used in the NAEI suggest that many hundreds of different organic compounds are emitted into the UK's atmosphere each year. These compounds react at different rates and by different chemical mechanisms, producing different amounts of ozone. Although the reactivity of compounds is dependent on the environmental conditions in which they react as well as their intrinsic properties, the development of cost-effective ozone control policies demands that some practical means of quantifying reactivity be developed. To this end, the Photochemical Ozone Creation Potential (POCP) concept has been developed to describe the contributions made by a large number of organic compounds to regional scale ozone formation in NW Europe. The methods of calculation of POCP values have been described in detail elsewhere (e.g. Derwent and Jenkin, 1991; Derwent *et al.*, 1996, 1998) and only a brief description is given here.

The index is determined from the calculated formation of ozone in the boundary layer, using a Photochemical Trajectory Model (PTM). The PTM simulates the chemical development in a boundary layer air parcel travelling along pre-selected trajectories over Europe. The air parcel thus picks up emissions of NO_X, CO, SO_2, methane, non-methane VOC and biogenic isoprene (based on available emissions inventories), which are processed using an appropriate description of the chemical and photochemical transformations leading to ozone formation, normally the Master Chemical Mechanism (MCM).

POCP values are calculated on the basis of ozone formation along a 5-day straight line reference trajectory originating over Austria and terminating in the southern British Isles. The trajectory describes a highly idealised anticyclonic meteorological situation of easterly winds, leading to a broad air flow carrying photochemically-aged polluted air masses out of Europe towards the UK, and represents trajectory paths which are frequently associated with elevated ozone concentrations in the southern British Isles. The production of ozone on such trajectories is currently believed to be predominantly limited by the availability of VOC, such that the reduction in ozone levels is best achieved by control of VOC emissions. Consequently, the chosen trajectory is particularly appropriate for the definition of a comparative ozone formation index for VOC. The chosen timescale of the calculation allows ozone concentrations to accumulate from an initial value of 50 ppbv to *ca.* 120 ppbv, which is typical of those currently observed in the UK during summertime photochemical pollution episodes.

The POCP for a particular VOC is determined by quantifying the effect of a small incremental increase in its emission on the ozone formation calculated along the trajectory, relative to that resulting from an identical increase in the emission (on a mass basis) of a reference VOC, which is taken to be ethene. Thus, the POCP for the given VOC 'i' is defined by equation (i),

$$POCP_i = \frac{\text{ozone increment with the } i\text{th VOC}}{\text{ozone increment with ethene}} \times 100 \qquad \text{(i)}$$

with the value for ethene being 100 by definition. The POCP is calculated from the results of separate model experiments. A base case scenario is initially run, followed by model runs in which the emission term of the selected VOC and of ethene are, in turn, incremented by *ca.* 1 kg km^{-2} day^{-1} across the entire model domain. The extra VOC emission stimulates additional ozone formation over the base case, and this incremental quantity of ozone can be defined for a particular point along the trajectory or integrated over the entire trajectory length. POCP values published previously for methane and 119 non-methane VOC using the MCM (Derwent *et al.*, 1998; Jenkin and Hayman, 1999) are based on the integrated incremental ozone formation.

Photochemical oxidant creation potential (POCP) values have been added to the NAEI NMVOC species profile database for all of the NMVOC compounds that are emitted. The POCP values fall into three categories:

1. POCPs determined by the standard methodology using a photochemical trajectory model containing fully developed chemical schemes and NAEI speciated VOC emissions as described briefly above. The values are published in the open literature (Derwent *et al*, 1998; Jenkin & Hayman, 1999).

2. POCPs estimated by a documented methodology. This allows assignment of POCPs on the basis of consideration of how the values determined using the standard methodology vary with structure and reactivity, i.e. this method is optimised on the basis of the determined values, and then used to calculate POCPs for additional VOCs within the same classes (i.e., hydrocarbons, oxygenates and halocarbons). The methodology is described more fully elsewhere (Jenkin, 1998; Jenkin *et al*, 1997).

3. POCPs which have been assigned on the basis of an educated guess, and fall into three sub-categories:

    a) Unspecific species or mixtures. Some entries cannot rigorously be assigned POCPs because there is insufficient information on the species identity, or because the entry is not a unique VOC. Thus, some assumption has to be made. An example of the former is 'ethyldimethylbenzene' for which there are 6 isomers that will have different POCPs. In this case, a particular isomer (for which a POCP determined using the standard methodology is available) is assumed. An example of the latter is 'unspeciated alkenes'. The assigned POCP is based on the mean of the 'determined' POCPs for alkenes. Of the 694 species included in the database, 65 are unspecific species or mixtures for which assumptions are necessary.

    b) Indefinable – assigned average. Of the 694 species, 80 VOCs cannot be defined POCPs because there is insufficient information on the kinetics and/or mechanism of their atmospheric degradation. These are generally VOCs containing heteroatoms such as N, Na, Si, S, K. Of these, 64 are assigned a value of 51.3, which is the average of all the 'determined' POCPs. These are those containing Na, K and some of the N-containing species. The 'unspeciated' category is also assumed to have a value of 51.3.

    c) Indefinable – assumed zero. The remaining 73 are assigned a zero value because it is suspected that a value of 51.3 is likely to be a severe overestimate. These are all the species containing S and Si (for which there is limited evidence that their oxidation may

even remove ozone), some N-containing species that are probably very unreactive, and various compounds which are likely to be emitted in the particulate phase (e.g. 4 and 5 ring polycyclic hydrocarbons, various polymers and certain pesticides)

In total, there are 116 'determined' POCPs, 360 'estimated' POCPs and 218 'guessed' POCPs. Most of the 'determined' POCPs are for compounds that are emitted in the greatest quantities, whereas most of the 'guessed' POCPs are for compounds that are emitted in the smallest quantities. In 1999, the total emission for each method of POCP evaluation was as follows:

1. Determined	1256.3 ktonnes (72.0% of the total)
2. Estimated	108.3 ktonnes (6.2% of the total)
3. Guessed:	
a) mixtures	297.7 ktonnes (17.1% of the total)
b) indefinable – assigned average	78.0 ktonnes (4.5% of the total)
c) indefinable – assigned zero	3.6 ktonnes (0.2% of the total)

It is worth noting that the emission of compounds with 'guessed' POCPs includes 178 ktonnes from forests.

POCP values assigned to each chemical species are shown in Appendix 5.

Recommendations for further work

A number of recommendations can be made. These are given below, divided into a number of different themes.

Further assessment of existing profiles

- More information is needed on the data used to derive a number of US EPA profiles that are used in the speciation module, so that a better judgement can be made as to whether the US profiles are 'appropriate' to the UK situation.
- The need for a profile for emissions from destructive abatement devices should be reviewed periodically.
- The adequacy of profiles for stationary combustion processes with regard to benzene should be considered further and, if necessary, new profiles developed.

Consultation with industry and other experts

- Species profiles used for oil exploration and production, refining and distribution of petroleum products might be improved through the input of data provided by the petroleum industry. The industry's trade associations should be given the opportunity to review the existing profiles and suggest improvements.
- Solvent suppliers and users should be given the opportunity to review species profiles used for solvent-using processes, particularly with the objectives of providing comment on the various assumptions made, and advising of significant changes in product formulations.

Development of new or improved profiles

- Profiles could be developed or improved for the following sources:
  - Forests
  - Chemical industry
  - Small 2-stroke engines such as those used in garden equipment
  - Other food: animal feed manufacture
  - Brewing: barley malting
  - Spirit manufacture: barley malting
  - Other food: margarine and other solid fats
  - Domestic combustion of natural gas

- Profiles would be useful for the following solvent/hydrocarbon types:
  - de-aromatised white spirit
  - rubber solvent
  - additional SBP solvents, including aromatic hydrocarbon mixtures
  - aerosol propellants
  - extraction grade hexane

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Appendices

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Appendix 1
Species Profiles

A list of the species profiles is given below, followed by the species profiles themselves.

Profile No	Description
2	Unspeciated
3	Paint manufacture
4	Ink manufacture
6	Adhesives
7	Aerosols (old)
8	Agrochemicals
9	Seed oil extraction
10	Leather industry
11	Other solvent use
12	Crude oil production
13	Crude oil distribution
14	Oil refineries
15	Chemical industry
16	Domestic combustion of coal - old profile
18	Domestic combustion of smokeless solid fuel - old profile
19	Bread baking
20	Alcoholic beverages - fermentation
22	Landfill
25	Gas leakage - old
26	Mobiles
27	Petrol exhausts
28	Diesel exhausts
30	Electricity generation using coal
31	Industrial combustion of oil (residual oil)
32	Electricity generation using gas
33	Industrial combustion of coal
34	Industrial combustion of oil (distillate oil)
35	Industrial combustion of gas
36	Domestic combustion of gas
38	Domestic Combustion of oil
39	Aircraft jet engines
40	2-stroke petrol engines
41	Coke Ovens

42	Forests
43	Wood impregnation
44	Decorative paint
45	Paint: OEM
46	Paint: vehicle refinishing
47	Paint: wood coating
48	Paint: coil coating
49	Paint: marine
50	Paint: heavy duty
51	Paint: general industrial
52	Paint: metal packaging
53	Rubber processes
54	Textile coating
55	Film coating
56	Printing - flexography
57	Printing - flexography/non-publication gravure
59	Printing - screen printing
60	Printing - heatset web offset
62	Solvent use - 1,1,1 trichloroethane
63	Solvent use - trichloroethene
64	Solvent use - tetrachloroethene
65	Solvent use - dichloromethane
66	Solvent use - white spirit
67	Surface cleaning - other solvents
68	Cosmetics and toiletries
69	Household products
70	Petrol distribution - leaded
71	Petrol distribution - unleaded
73	Printing - publication gravure
74	Petroleum processes
75	Aircraft landing/takeoff (LTO) - commercial
77	Aircraft landing/takeoff (LTO) - military
83	By-product coke oven stack gas
86	Coke oven blast furnace gas
87	External combustion boiler - coal slurry
88	External combustion boiler - coke oven gas
91	External combustion boiler - refinery gas
94	Flares - natural gas
95	Internal combustion engine - natural gas
98	Open hearth furnace with oxygen lance
102	Residential Wood Combustion - old profile
103	Cement industry
104	Paper coating
105	Print chemicals
106	Leather degreasing
107	Carcare products
108	Road transport, petrol, conventional
109	Road transport, petrol, catalysts
110	Road transport, derv, light duty

111	Road transport, duty, heavy duty
112	Road transport, LPG
113	Road transport, petrol, evaporative
114	Shipping
115	Waste incineration
116	Solvent use - SBP 65/70
117	Solvent use - SBP 80/110
118	Solvent use - SBP solvent (average)
119	Solvent use - aromatic hydrocarbons 160-180 C
120	Solvent use - aromatic hydrocarbons 180-220 C
121	Solvent use - solvent xylene
122	Domestic combustion of coal - new profile
123	Domestic combustion of smokeless solid fuel - new profile
124	Gas leakage - new
125	Residential wood combustion
126	Industrial wood combustion
127	Gasification processes
128	Aircraft (temporary)
129	Cars, catalyst, urban driving
130	Cars, catalyst, motorway driving
131	Cars, catalyst, rural driving
132	Cars, catalyst, cold start
133	Coke ovens (temporary)
134	SSF manufacture (temporary)
135	Blast furnaces
136	Press washups
137	Solvent use - Bisol K
138	Printing - overprint varnishes
139	Solvent use - Shellsol D70
140	Aerosols

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

2 Unspeciated

Default profile where no data are available

Default profile where no data are available

Species	*% of total NMVOC*	*POCP*
unspeciated	100.000	51.3

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

3 Paint manufacture

From paint_speciation98.xls on naei98 directory based on BCF data

Based on BCF data - see naei99/rawdata/datafrmt/voc/species/paint_speciation99.xls

Species	*% of total NMVOC*	*POCP*
2-butanone	3.319%	37.3
2-(2-ethoxyethoxy)ethyl acetate	0.039%	34.6
2-methyldecalin	0.033%	41.4
2,3-dimethylbutane	0.030%	54.1
2-[2-(2-ethoxy-ethoxy)-ethoxy]ethanol	0.100%	35.7
2-acetoxy-propyl acetate	0.100%	14.3
2,3,5-trimethylhexane	0.001%	42.6
2-butanol	1.870%	44.7
2-butoxyethanol	0.897%	48.3
2,5-dimethylhexane	0.001%	44.6
2,3-dimethylheptane	0.046%	42.6
2,5-dimethyldecane	0.018%	34.6
2,2-dimethylpentane	0.034%	38.6
2-methyl-1-propanol	2.425%	36.0
2,2,5-trimethylhexane	0.004%	37.6
2,2,4-trimethyl-1,3-pentanediol monoisobutyrate	0.055%	27.5
2-butanone oxime	0.225%	51.3
2-methyldecane	0.136%	37.5
2,3,4-trimethylhexane	0.004%	42.9
2,6-dimethylundecane	0.005%	31.7
2,5-dimethyloctane	0.057%	40.2
2,5-dimethylheptane	0.021%	51.2
2,6-dimethyldecane	0.022%	35.1
2,4-dimethylpentane	0.034%	46.6
2,6-dimethylheptane	0.023%	42.3
2,4-dimethylheptane	0.007%	42.6
2,6-dimethyloctane	0.171%	40.2
2-methyl-2,4-pentanediol	0.138%	46.4
2-methyl-5-ethyloctane	0.047%	38.0
2-(2-ethoxyethoxy)ethanol	0.273%	49.3
2,7-dimethyloctane	0.034%	39.9
2-(2-butoxyethoxy)ethanol	0.347%	50.2
2,3-dimethylundecane	0.008%	31.7
2,3-dimethylpentane	0.034%	39.1
2,3-dimethyloctane	0.014%	40.2

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint manufacture

2-(2-butoxyethoxy)ethyl acetate	0.039%	40.0
2,3-dimethylnonane	0.034%	37.7
2,3,3,4-tetramethylpentane	0.001%	37.2
2,4-dimethyl-1-(1-methylethyl)benzene	0.027%	111.7
1-methylbutylbenzene	0.022%	105.7
2,2,3,3-tetramethylhexane	0.054%	19.2
1-methyl-4-isopropylcyclohexane	0.142%	43.0
2-ethyl-1,3-dimethylbenzene	0.044%	114.6
2-hexoxyethanol	0.100%	44.7
2-methyl-1-butylbenzene	0.003%	86.2
1-methyl-4-tertbutylbenzene	0.023%	87.3
1-methyl-3-propylbenzene	0.080%	104.1
2-methylheptane	0.007%	44.6
1-methyl-3-isopropylcyclopentane	0.001%	39.1
1-methyl-4-isopropylbenzene	0.137%	89.6
2-ethoxyethanol	0.434%	38.6
1-methylindan	0.010%	80.0
2-butoxyethyl acetate	0.375%	35.1
1-methylindene	0.001%	136.2
1-methyl-2-propylbenzene	0.040%	88.4
1-methyl-2-isopropylbenzene	0.034%	88.4
1-methyl-3-(isopropyl)benzene	0.040%	104.1
2-ethoxyethyl acetate	0.488%	34.6
3-ethyl-2-methylhexane	0.004%	43.1
3-methylnonane	0.211%	40.2
4-methyloctane	0.064%	42.3
3-methylhexane	0.243%	36.4
5-methyldecane	0.069%	37.7
3-methylheptane	0.005%	45.0
2-methylundecane	0.022%	35.2
3-methyldecane	0.153%	37.7
2-propanol	1.312%	18.8
3-ethyltoluene	0.123%	101.9
3-ethyloctane	0.036%	44.4
3-ethylhexane	0.001%	41.5
3,4-dimethylheptane	0.056%	42.6
3-ethylheptane	0.046%	43.1
3-methyloctane	0.056%	42.6
2-propyl acetate	0.556%	21.1

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint manufacture

3,3,4-trimethylhexane	0.001%	37.6
3,3,5-trimethylheptane	0.004%	36.2
3-ethyl-2-methylheptane	0.207%	39.9
3,7-dimethylnonane	0.047%	37.9
5-methylundecane	0.021%	35.1
3,3-dimethylheptane	0.005%	37.2
3,3-dimethyloctane	0.048%	35.8
3,6-dimethyloctane	0.042%	40.5
3,5-dimethyloctane	0.015%	40.5
3,3-dimethylpentane	0.034%	37.8
3,4-dimethylhexane	0.001%	45.3
6-ethyl-2-methyldecane	0.003%	32.8
2-methyloctane	0.063%	42.8
2-methylhexane	0.242%	41.1
4-methylnonane	0.144%	40.2
4-methylheptane	0.003%	45.0
4-propylheptane	0.003%	40.5
4-methyldecane	0.256%	37.7
4-methyl-4-hydroxy-2-pentanone	1.993%	30.7
2-methylnonane	0.183%	39.9
4-methyl-2-pentanone	4.184%	49.0
4-methyl-2-pentanol	0.056%	60.9
4-methyl-1,3-dioxol-2-one	0.008%	21.9
4-ethyltoluene	0.051%	90.6
5-methyl-2-hexanone	0.359%	51.6
4-ethyl-1,2-dimethylbenzene	0.029%	114.6
4,6-dimethylindan	0.003%	132.5
3-methylundecane	0.026%	35.1
3-pentanone	0.335%	41.4
4,4-dimethylheptane	0.002%	37.2
4-ethyloctane	0.016%	44.4
4,5-dimethylnonane	0.033%	37.9
3-methylpentane	0.272%	47.9
4,7-dimethylindan	0.001%	132.5
6-ethyl-2-methyloctane	0.008%	38.0
2-methylpentane	0.302%	42.0
ethanol	1.143%	39.9
ethyl lactate	0.209%	32.8
dodecane	0.051%	35.7

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint manufacture

ethylcyclohexane	0.048%	48.3
C9 cycloalkanes	0.009%	41.4
C13 alkanes	0.001%	31.7
C11 aromatic hydrocarbons	0.001%	134.2
decalin	0.047%	44.4
bis(2-hydroxyethyl)ether	0.008%	40.2
C10 alkanes	0.126%	38.7
decane	0.841%	38.4
benzyl alcohol	0.169%	46.9
acetone	2.838%	9.4
C11 alkanes	0.148%	36.4
ethylbenzene	3.519%	73.0
ethyl acetate	2.184%	20.9
butylcyclohexane	0.134%	42.5
ethylisopropylbenzene	0.001%	105.7
8-methyl-1-nonanol	0.383%	50.2
cyclohexanone	0.701%	29.9
cyclohexanol	0.383%	51.8
ethyl hexanol	0.123%	53.5
C8 alkanes	0.001%	42.2
butyrolactone	0.030%	51.3
6-methylundecane	0.017%	35.1
butyl glycolate	0.141%	26.8
dichloromethane	0.225%	6.8
C11 cycloalkanes	0.011%	38.4
cycloheptane	0.001%	53.4
butyl acetate	2.479%	26.9
butoxyl	0.141%	51.3
diethylbenzene	0.341%	105.7
dipentene	0.247%	74.5
dimethyl esters	0.049%	17.1
dimethylnonane	0.018%	38.4
dimethylcyclopentane	0.136%	45.8
C10 cycloalkanes	0.159%	38.4
C12 alkanes	0.047%	35.7
butyl lactate	0.141%	29.1
butylbenzene	0.035%	69.0
C9 alkanes	0.009%	40.4
cyclohexane	0.287%	29.0

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint manufacture

ethyldimethylbenzene	2.054%	132.0
C12 cycloalkanes	0.004%	35.7
dimethylformamide	0.030%	51.3
methylcyclopentane	0.196%	48.1
methylcyclohexane	0.114%	51.0
propylcyclohexane	0.175%	45.4
methyltetralin	0.002%	114.0
propyl acetate	0.070%	28.2
pine oil	0.077%	74.5
phenol	0.117%	63.3
pentylcyclohexane	0.033%	39.6
pentylbenzene	0.001%	67.3
p-xylene	2.291%	101.0
unspeciated	0.010%	51.3
octane	0.035%	45.3
propylbenzene	0.566%	63.6
methylethylbenzene	3.864%	94.1
methylindane	0.191%	80.0
methylpropylbenzene	0.921%	105.7
undecane	0.440%	38.4
octahydroindan	0.024%	44.5
o-xylene	2.146%	105.3
N-methyl pyrrolidone	0.008%	51.3
naphthalene	0.244%	97.7
nitropentane	0.114%	18.5
nonane	0.485%	41.4
trichloroethene	0.154%	32.5
tert-pentylbenzene	0.013%	67.3
isopropylbenzene	0.033%	50.0
toluene	12.995%	63.7
indan	0.127%	79.7
m-xylene	9.641%	110.8
propylcyclopentane	0.001%	44.5
isophorone	0.388%	77.6
isopentylbenzene	0.005%	67.3
hexylcyclohexane	0.001%	36.7
tert-butylcyclopropane	0.001%	11.5
styrene	1.901%	14.2
hexane	0.785%	48.2

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint manufacture

methanol	0.536%	14.0
propylene oxide	0.027%	13.4
methylcyclodecane	0.007%	39.3
heptane	0.289%	49.4
tetramethylcyclohexane	0.026%	38.5
unspeciated hydrocarbons	0.045%	71.9
unspeciated aromatic hydrocarbons	0.995%	95.4
unspeciated cycloalkanes	0.005%	43.4
unspeciated amines	0.114%	51.3
unspeciated alkanes	0.011%	36.8
1-ethyl-2,2,6-trimethylcyclohexane	0.041%	37.2
1-ethoxy-2-propyl acetate	0.103%	35.2
1,2-dimethyl-3-isopropylcyclopentane	0.013%	39.3
1-ethyl-1,4-dimethylcyclohexane	0.016%	38.7
1,2,3,4-tetramethylbenzene	0.291%	114.6
1,2-dimethylcyclohexane	0.017%	48.2
1,2,4,5-tetramethylbenzene	0.433%	114.6
1-ethyl-2,3-dimethylbenzene	0.027%	114.6
1-methoxy-2-propyl acetate	0.457%	32.3
1-ethyl-3-methylcyclohexane	0.122%	45.6
1,3-ethylmethylcyclopentane	0.002%	44.2
1-ethyl-3,5-dimethylbenzene	0.037%	136.0
1,3-dimethylcyclohexane	0.015%	48.2
1,2-ethanedioldiacetate	0.209%	16.0
1,2-ethylmethylcyclopentane	0.003%	44.2
1-methyl-1-phenylcyclopropane	0.007%	63.7
1,2,4,4-tetramethylcyclopentane	0.006%	37.5
1,1-dimethylcyclohexane	0.003%	42.8
1,2,4-trimethylcyclohexane	0.021%	45.4
1,2,3,5-tetramethylbenzene	0.631%	136.0
1-butanol	3.438%	62.0
1-ethylpropylbenzene	0.010%	105.7
(2-methyl-1-propyl)acetate	0.444%	32.8
1,2,4-trimethylbenzene	4.562%	127.8
1-ethyl-4-methylcyclohexane	0.052%	45.6
1-(2-butoxy-1-methyl-ethoxy)-2-propanol	0.134%	41.3
1-methoxy-2-propanol	0.733%	35.5
1,1,1-trichloroethane	0.154%	0.9
1,2,3,5-tetramethylcyclohexane	0.037%	42.7

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint manufacture

1-ethoxy-2-propanol	0.175%	49.7
1,2,3,4-tetrahydronaphthalene	0.014%	115.1
(1-methylpropyl)cyclohexane	0.147%	38.5
1,4-dimethylcyclohexane	0.039%	48.2
1,4-dimethyl-2-isopropylbenzene	0.005%	111.7
(2-methylbutyl)cyclohexane	0.011%	39.8
(2-methylpropyl)cyclohexane	0.080%	42.7
1,2,4-trimethlycyclopentane	0.001%	43.6
1-ethyl-2-propylcyclohexane	0.017%	40.0
1,1,4,4-tetramethylcyclohexane	0.023%	34.3
1-ethyl-2-propylbenzene	0.009%	86.2
1,3,5-trimethylbenzene	1.192%	138.1
1,2,3-trimethylcyclopentane	0.002%	43.6
1-methyl-1-propylcyclopentane	0.021%	37.9
1-ethyl-2,3-dimethylcyclohexane	0.019%	42.3
1,1,2-trimethylcyclohexane	0.033%	41.2
1,3-dimethyl-4-ethylbenzene	0.033%	114.6
1,4-diethylbenzene	0.034%	89.6
1,2,3-trimethylcyclohexane	0.069%	45.4
1,1,3-trimethylcyclohexane	0.038%	41.2
1,2-propanediol	0.089%	44.6
1,3-diethylbenzene	0.033%	104.1
1,3-dimethyl-5-propylbenzene	0.004%	132.5
(1-methylethyl)cyclohexane	0.081%	40.5
1,2,3-trimethylbenzene	1.249%	126.7

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

4 Ink manufacture

Developed from data provided by the coatings industry

see naei99/rawdata/datafrmt/voc/species/printing_inks.xls

Species	*% of total NMVOC*	*POCP*
2,3-dimethylbutane	0.081%	54.1
2-butoxyethanol	0.625%	48.3
2-butanone	0.717%	37.3
1-propanol	3.586%	56.1
2-propanol	2.510%	18.8
2-propyl acetate	4.304%	21.1
2-methylpentane	0.815%	42.0
3-methylpentane	0.733%	47.9
ethanol	39.450%	39.9
cyclohexanone	0.625%	29.9
ethyl acetate	12.194%	20.9
ethylbenzene	0.312%	73.0
cyclohexane	0.122%	29.0
propyl acetate	3.945%	28.2
toluene	3.958%	63.7
hexane	1.996%	48.2
o-xylene	0.187%	105.3
m-xylene	0.859%	110.8
unspeciated	4.852%	51.3
p-xylene	0.203%	101.0
tetradecane	12.762%	30.7
methylcyclopentane	0.326%	48.1
1-methoxy-2-propanol	2.418%	35.5
1-ethoxy-2-propanol	1.793%	49.7
1-methoxy-2-propyl acetate	0.625%	32.3

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

6 Adhesives

Based on data from SIA - see naei99/rawdata/datafrmt/voc/species/adhesives.xls

Based on SIA data - see naei99/rawdata/datafrmt/voc/species/adhesive.xls

Species	*% of total NMVOC*	*POCP*
2-(2-butoxyethoxy)ethyl acetate	0.094%	40.0
2-methoxyethyl acetate	0.094%	40.5
2-methoxyethanol	0.094%	30.7
2-(2-butoxyethoxy)ethanol	0.094%	50.2
2,4-dimethylpentane	0.359%	46.6
2-isopropoxyethanol	0.094%	51.4
2,3-dimethylpentane	0.359%	39.1
2,3-dimethylbutane	0.319%	54.1
2-butoxyethyl acetate	0.094%	35.1
2,2-dimethylpentane	0.359%	38.6
2-[2-(2-ethoxy-ethoxy)-ethoxy]ethanol	0.094%	35.7
2-ethoxyethyl acetate	0.094%	34.6
2-butanone	6.974%	37.3
2-ethoxyethanol	0.094%	38.6
2-(methoxyethoxy)ethanol	0.094%	42.8
2-(2-ethoxyethoxy)ethyl acetate	0.094%	34.6
2-butoxyethanol	0.094%	48.3
1-propanol	1.507%	56.1
2-(2-ethoxyethoxy)ethanol	0.094%	49.3
3-methylhexane	2.552%	36.4
3-methylpentane	2.871%	47.9
4-methyl-2-pentanone	6.974%	49.0
2-methylpentane	3.190%	42.0
2-methylhexane	2.552%	41.1
3,3-dimethylpentane	0.359%	37.8
2-propanol	1.507%	18.8
cyclohexane	3.030%	29.0
ethylbenzene	1.462%	73.0
acetone	6.974%	9.4
ethyl acetate	4.558%	20.9
dichloromethane	5.715%	6.8
butyl acetate	4.558%	26.9
ethanol	1.507%	39.9
dimethylcyclopentane	1.435%	45.8
heptane	3.030%	49.4

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Adhesives

toluene	7.311%	63.7
methylcyclohexane	1.116%	51.0
methylcyclopentane	2.073%	48.1
hexane	8.293%	48.2
o-xylene	0.877%	105.3
p-xylene	0.950%	101.0
trichloroethene	5.715%	32.5
m-xylene	4.021%	110.8
1-ethoxy-2-propanol	0.094%	49.7
1-methoxy-2-propanol	0.094%	35.5
1-(2-methoxy-1-methyl-ethoxy)-2-propanol	0.094%	53.5
1-ethoxy-2-propyl acetate	0.094%	35.2
1-(2-ethoxy-1-methyl-ethoxy)-2-propanol	0.094%	56.4
1,1,1-trichloroethane	5.715%	0.9
1-methoxy-2-propyl acetate	0.094%	32.3

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

7 Aerosols (old)

Derived from information provided by British Aerosol Manufacturers Association and Solvent Industry Association

Based on BAMA and SIA data - see naei99/rawdata/datafrmt/voc/species/aerosols_00.xls

Species	*% of total NMVOC*	*POCP*
2,3-dimethylnonane	0.033%	37.7
2,5-dimethylheptane	0.021%	51.2
2,6-dimethylheptane	0.022%	42.3
2,5-dimethylhexane	0.001%	44.6
2,6-dimethyloctane	0.164%	40.2
2,3-dimethylundecane	0.008%	31.7
2,3-dimethyloctane	0.014%	40.2
2,6-dimethyldecane	0.021%	35.1
2,6-dimethylundecane	0.005%	31.7
2,5-dimethyloctane	0.055%	40.2
2,7-dimethyloctane	0.033%	39.9
2,4-dimethylheptane	0.007%	42.6
2,5-dimethyldecane	0.017%	34.6
2-methylheptane	0.007%	44.6
2-methyldecane	0.130%	37.5
2-methyl-1-butylbenzene	0.003%	86.2
2-methyldecalin	0.032%	41.4
2-methyl-5-ethyloctane	0.045%	38.0
2-ethyl-1,3-dimethylbenzene	0.042%	114.6
2,4-dimethyl-1-(1-methylethyl)benzene	0.026%	111.7
2,2,3,3-tetramethylhexane	0.051%	19.2
2-methylundecane	0.021%	35.2
1-methyl-4-tertbutylbenzene	0.022%	87.3
3,3,4-trimethylhexane	0.001%	37.6
3,3,5-trimethylheptane	0.004%	36.2
3,3-dimethylheptane	0.005%	37.2
3,3-dimethyloctane	0.046%	35.8
2,2,5-trimethylhexane	0.003%	37.6
1-methyl-4-isopropylcyclohexane	0.136%	43.0
2,3-dimethylheptane	0.044%	42.6
3,4-dimethylheptane	0.054%	42.6
1-methyl-1-propylcyclopentane	0.020%	37.9
1-methyl-2-propylbenzene	0.038%	88.4
1-methyl-2-isopropylbenzene	0.033%	88.4
1-methylindene	0.001%	136.2

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Aerosols (old)

1-methylindan	0.010%	80.0
1-methylbutylbenzene	0.021%	105.7
1-methyl-4-isopropylbenzene	0.131%	89.6
1-methyl-3-(isopropyl)benzene	0.038%	104.1
2,3,5-trimethylhexane	0.001%	42.6
1-methyl-3-isopropylcyclopentane	0.001%	39.1
1-ethyl-3,5-dimethylbenzene	0.036%	136.0
1-methyl-3-propylbenzene	0.076%	104.1
1-methyl-1-phenylcyclopropane	0.007%	63.7
2,3,4-trimethylhexane	0.003%	42.9
2-methyloctane	0.060%	42.8
1-ethyl-3-methylcyclohexane	0.117%	45.6
1-ethyl-4-methylcyclohexane	0.050%	45.6
2,3,3,4-tetramethylpentane	0.001%	37.2
1-ethylpropylbenzene	0.010%	105.7
2-methylnonane	0.175%	39.9
4-ethyltoluene	0.049%	90.6
4-ethyloctane	0.015%	44.4
4-ethyl-1,2-dimethylbenzene	0.028%	114.6
4,7-dimethylindan	0.001%	132.5
4,6-dimethylindan	0.003%	132.5
4,5-dimethylnonane	0.032%	37.9
4,4-dimethylheptane	0.002%	37.2
3-methylundecane	0.025%	35.1
3-methyloctane	0.054%	42.6
3-methylnonane	0.202%	40.2
4-methyldecane	0.245%	37.7
3-methylheptane	0.005%	45.0
ethylcyclohexane	0.046%	48.3
3-methyldecane	0.147%	37.7
3-ethyltoluene	0.117%	101.9
3-ethyloctane	0.034%	44.4
3-ethylhexane	0.001%	41.5
3-ethylheptane	0.044%	43.1
3-ethyl-2-methylhexane	0.003%	43.1
3-ethyl-2-methylheptane	0.198%	39.9
3,7-dimethylnonane	0.045%	37.9
3,6-dimethyloctane	0.040%	40.5
3,5-dimethyloctane	0.015%	40.5

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Aerosols (old)

3,4-dimethylhexane	0.001%	45.3
3-methylhexane	0.001%	36.4
C12 alkanes	0.045%	35.7
decane	0.805%	38.4
C10 cycloalkanes	0.153%	38.4
butylcyclohexane	0.129%	42.5
butylbenzene	0.033%	69.0
C11 aromatic hydrocarbons	0.001%	134.2
C11 cycloalkanes	0.010%	38.4
6-methylundecane	0.016%	35.1
6-ethyl-2-methyloctane	0.008%	38.0
C11 alkanes	0.142%	36.4
C9 alkanes	0.009%	40.4
6-ethyl-2-methyldecane	0.003%	32.8
ethylisopropylbenzene	0.001%	105.7
C12 cycloalkanes	0.004%	35.7
C10 alkanes	0.121%	38.7
5-methyldecane	0.066%	37.7
4-propylheptane	0.003%	40.5
C13 alkanes	0.001%	31.7
C9 cycloalkanes	0.009%	41.4
unspeciated hydrocarbons	0.043%	71.9
decalin	0.045%	44.4
dimethylnonane	0.017%	38.4
dodecane	0.049%	35.7
4-methyloctane	0.062%	42.3
4-methylnonane	0.138%	40.2
ethylbenzene	0.019%	73.0
4-methylheptane	0.003%	45.0
5-methylundecane	0.021%	35.1
cycloheptane	0.001%	53.4
unspeciated	0.010%	51.3
tetramethylcyclohexane	0.025%	38.5
unspeciated alkanes	0.010%	36.8
C8 alkanes	0.001%	42.2
undecane	0.421%	38.4
toluene	0.005%	63.7
unspeciated cycloalkanes	0.005%	43.4
methyltetralin	0.002%	114.0

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Aerosols (old)

heptane	0.002%	49.4
hexylcyclohexane	0.001%	36.7
indan	0.029%	79.7
isopentylbenzene	0.005%	67.3
isopropylbenzene	0.032%	50.0
m-xylene	0.017%	110.8
methylcyclodecane	0.007%	39.3
methylcyclohexane	0.008%	51.0
tert-pentylbenzene	0.013%	67.3
naphthalene	0.004%	97.7
nonane	0.465%	41.4
o-xylene	0.044%	105.3
octahydroindan	0.023%	44.5
octane	0.033%	45.3
propylcyclopentane	0.001%	44.5
pentylbenzene	0.001%	67.3
tert-butylcyclopropane	0.001%	11.5
pentylcyclohexane	0.032%	39.6
p-xylene	0.015%	101.0
propylcyclohexane	0.167%	45.4
propylbenzene	0.073%	63.6
1,2,4,5-tetramethylbenzene	0.016%	114.6
1-ethyl-2-propylbenzene	0.008%	86.2
1,3-dimethyl-4-ethylbenzene	0.032%	114.6
1,2,3-trimethylcyclohexane	0.066%	45.4
propane	7.348%	17.6
2-butanone	1.750%	37.3
butane	41.637%	35.2
1,2,3-trimethylcyclopentane	0.002%	43.6
1,3,5-trimethylbenzene	0.112%	138.1
1,3-diethylbenzene	0.032%	104.1
1,2,4,4-tetramethylcyclopentane	0.006%	37.5
1,2,3,5-tetramethylcyclohexane	0.035%	42.7
dimethyl ether	1.000%	18.9
1-propanol	3.500%	56.1
1,2,3,5-tetramethylbenzene	0.022%	136.0
1-ethyl-2,3-dimethylcyclohexane	0.018%	42.3
1-ethyl-2,3-dimethylbenzene	0.026%	114.6
1,2,4-trimethlycyclopentane	0.001%	43.6

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Aerosols (old)

1,2,4-trimethylbenzene	0.231%	127.8
1,2,3,4-tetrahydronaphthalene	0.013%	115.1
1-ethyl-2,2,6-trimethylcyclohexane	0.039%	37.2
1,2,3,4-tetramethylbenzene	0.017%	114.6
1,2,4-trimethylcyclohexane	0.021%	45.4
2-propanol	3.500%	18.8
1,3-ethylmethylcyclopentane	0.002%	44.2
1,1,2-trimethylcyclohexane	0.032%	41.2
1,2,3-trimethylbenzene	0.100%	126.7
(2-methylbutyl)cyclohexane	0.010%	39.8
ethyl acetate	3.500%	20.9
(1-methylpropyl)cyclohexane	0.141%	38.5
(1-methylethyl)cyclohexane	0.078%	40.5
1,4-dimethylcyclohexane	0.037%	48.2
(2-methylpropyl)cyclohexane	0.076%	42.7
1,4-diethylbenzene	0.033%	89.6
1,3-dimethylcyclohexane	0.015%	48.2
ethanol	28.000%	39.9
1,1,3-trimethylcyclohexane	0.036%	41.2
1-ethyl-2-propylcyclohexane	0.016%	40.0
1,2-dimethylcyclohexane	0.016%	48.2
1,1,4,4-tetramethylcyclohexane	0.022%	34.3
1,2-ethylmethylcyclopentane	0.003%	44.2
1,1-dimethylcyclohexane	0.003%	42.8
1,2-dimethyl-3-isopropylcyclopentane	0.012%	39.3
1-ethyl-1,4-dimethylcyclohexane	0.015%	38.7
1,4-dimethyl-2-isopropylbenzene	0.005%	111.7
1,3-dimethyl-5-propylbenzene	0.004%	132.5
acetone	1.750%	9.4

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

8 Agrochemicals

Based on SIA data

Based on SIA data - see naei99/rawdata/datafrmt/voc/species/agrochemicals.xls

Species	*% of total NMVOC*	*POCP*
1-methylindene	0.002%	136.2
2-butoxyethanol	0.370%	48.3
1-methylindan	0.018%	80.0
1-methylbutylbenzene	0.039%	105.7
1-propanol	2.547%	56.1
2-ethoxyethanol	0.370%	38.6
2-butoxyethyl acetate	0.370%	35.1
1-methyl-4-tertbutylbenzene	0.040%	87.3
2-ethoxyethyl acetate	0.370%	34.6
1-methyl-4-isopropylcyclohexane	0.248%	43.0
2-methyldecane	0.239%	37.5
2-methylheptane	0.013%	44.6
2-ethyl-1,3-dimethylbenzene	0.076%	114.6
2-methyl-1-butylbenzene	0.005%	86.2
1-methyl-3-propylbenzene	0.140%	104.1
1-methyl-3-isopropylcyclopentane	0.002%	39.1
1-methyl-3-(isopropyl)benzene	0.071%	104.1
1-methyl-2-propylbenzene	0.071%	88.4
2-isopropoxyethanol	0.370%	51.4
2-methoxyethanol	0.370%	30.7
1-methyl-2-isopropylbenzene	0.060%	88.4
1-methyl-4-isopropylbenzene	0.240%	89.6
2,4-dimethylheptane	0.013%	42.6
2,3,5-trimethylhexane	0.002%	42.6
2,7-dimethyloctane	0.060%	39.9
2,6-dimethylundecane	0.009%	31.7
2,3-dimethylundecane	0.014%	31.7
2-methyl-5-ethyloctane	0.083%	38.0
2,4-dimethyl-1-(1-methylethyl)benzene	0.047%	111.7
2-(2-butoxyethoxy)ethanol	0.370%	50.2
2,6-dimethylheptane	0.041%	42.3
2,3-dimethylnonane	0.060%	37.7
2,6-dimethyldecane	0.039%	35.1
2-methoxyethyl acetate	0.370%	40.5
2,5-dimethyldecane	0.031%	34.6

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Agrochemicals

2,5-dimethyloctane	0.101%	40.2
2,5-dimethylheptane	0.038%	51.2
2,5-dimethylhexane	0.002%	44.6
2,6-dimethyloctane	0.300%	40.2
2-methyldecalin	0.058%	41.4
2-butanone	4.720%	37.3
2,2,5-trimethylhexane	0.006%	37.6
2,3,3,4-tetramethylpentane	0.002%	37.2
2,3,4-trimethylhexane	0.006%	42.9
2,3-dimethyloctane	0.025%	40.2
2-(methoxyethoxy)ethanol	0.370%	42.8
2,2,3,3-tetramethylhexane	0.094%	19.2
2-(2-ethoxyethoxy)ethyl acetate	0.370%	34.6
2-(2-ethoxyethoxy)ethanol	0.370%	49.3
2-(2-butoxyethoxy)ethyl acetate	0.370%	40.0
2,3-dimethylheptane	0.080%	42.6
2-[2-(2-ethoxy-ethoxy)-ethoxy]ethanol	0.370%	35.7
3,6-dimethyloctane	0.074%	40.5
3-ethyltoluene	0.215%	101.9
3-ethylhexane	0.002%	41.5
3-ethylheptane	0.080%	43.1
3-ethyloctane	0.063%	44.4
3,3-dimethylheptane	0.009%	37.2
3,7-dimethylnonane	0.083%	37.9
4-methylheptane	0.005%	45.0
5-methylundecane	0.038%	35.1
4-methylnonane	0.253%	40.2
3,5-dimethyloctane	0.027%	40.5
3,4-dimethylhexane	0.002%	45.3
3,4-dimethylheptane	0.099%	42.6
3,3-dimethyloctane	0.085%	35.8
3-ethyl-2-methylheptane	0.363%	39.9
4-methyldecane	0.449%	37.7
4-ethyltoluene	0.089%	90.6
4-ethyloctane	0.028%	44.4
4-ethyl-1,2-dimethylbenzene	0.052%	114.6
4,7-dimethylindan	0.002%	132.5
4,6-dimethylindan	0.006%	132.5
4,5-dimethylnonane	0.058%	37.9

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Agrochemicals

3-methyldecane	0.269%	37.7
4-propylheptane	0.005%	40.5
3-methylheptane	0.009%	45.0
3-methylundecane	0.046%	35.1
3-methyloctane	0.099%	42.6
3-methylnonane	0.371%	40.2
3-methylhexane	0.002%	36.4
5-methyldecane	0.121%	37.7
3-ethyl-2-methylhexane	0.006%	43.1
4,4-dimethylheptane	0.003%	37.2
6-ethyl-2-methyldecane	0.005%	32.8
2-propanol	2.547%	18.8
3,3,5-trimethylheptane	0.008%	36.2
3,3,4-trimethylhexane	0.002%	37.6
2-methylnonane	0.321%	39.9
4-methyloctane	0.113%	42.3
2-methyloctane	0.110%	42.8
6-ethyl-2-methyloctane	0.014%	38.0
2-methylundecane	0.039%	35.2
decane	1.476%	38.4
cycloheptane	0.002%	53.4
diethylbenzene	1.176%	105.7
C12 cycloalkanes	0.008%	35.7
ethyldimethylbenzene	4.116%	132.0
butylcyclohexane	0.236%	42.5
C9 alkanes	0.016%	40.4
C10 cycloalkanes	0.280%	38.4
butylbenzene	0.061%	69.0
ethanol	2.547%	39.9
dimethylnonane	0.031%	38.4
ethyl acetate	2.415%	20.9
dodecane	0.090%	35.7
C9 cycloalkanes	0.016%	41.4
C13 alkanes	0.002%	31.7
C11 aromatic hydrocarbons	0.002%	134.2
decalin	0.082%	44.4
C8 alkanes	0.002%	42.2
C10 alkanes	0.222%	38.7
ethylbenzene	0.034%	73.0

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Agrochemicals

C11 cycloalkanes	0.019%	38.4
C11 alkanes	0.259%	36.4
ethylcyclohexane	0.085%	48.3
C12 alkanes	0.083%	35.7
ethylisopropylbenzene	0.002%	105.7
acetone	4.720%	9.4
6-methylundecane	0.030%	35.1
isopropylbenzene	0.059%	50.0
nonane	0.852%	41.4
tert-butylcyclopropane	0.002%	11.5
propylcyclopentane	0.002%	44.5
tert-pentylbenzene	0.024%	67.3
propylbenzene	2.486%	63.6
isopentylbenzene	0.009%	67.3
tetramethylcyclohexane	0.046%	38.5
indan	0.054%	79.7
hexylcyclohexane	0.002%	36.7
heptane	0.003%	49.4
m-xylene	0.031%	110.8
methylcyclodecane	0.013%	39.3
pentylcyclohexane	0.058%	39.6
methylcyclohexane	0.014%	51.0
naphthalene	0.008%	97.7
toluene	0.009%	63.7
methyltetralin	0.004%	114.0
o-xylene	0.081%	105.3
methylpropylbenzene	2.352%	105.7
pentylbenzene	0.002%	67.3
methylethylbenzene	17.638%	94.1
p-xylene	0.028%	101.0
octahydroindan	0.042%	44.5
octane	0.061%	45.3
propylcyclohexane	0.306%	45.4
undecane	0.772%	38.4
unspeciated	0.018%	51.3
unspeciated cycloalkanes	0.009%	43.4
unspeciated aromatic hydrocarbons	2.940%	95.4
unspeciated hydrocarbons	0.079%	71.9
unspeciated alkanes	0.019%	36.8

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Agrochemicals

1,2,4-trimethylbenzene	18.649%	127.8
1,2,3,5-tetramethylbenzene	0.432%	136.0
1-ethyl-2-propylbenzene	0.015%	86.2
1,1,2-trimethylcyclohexane	0.058%	41.2
1,2,3,5-tetramethylcyclohexane	0.064%	42.7
1,2,4,4-tetramethylcyclopentane	0.011%	37.5
1,2,3-trimethylbenzene	4.299%	126.7
1-ethyl-2,3-dimethylbenzene	0.048%	114.6
1-ethyl-3,5-dimethylbenzene	0.066%	136.0
1-ethyl-2,2,6-trimethylcyclohexane	0.072%	37.2
1,2,3-trimethylcyclopentane	0.003%	43.6
1-ethoxy-2-propanol	0.370%	49.7
1-ethoxy-2-propyl acetate	0.370%	35.2
1-ethyl-4-methylcyclohexane	0.091%	45.6
1-ethyl-3-methylcyclohexane	0.214%	45.6
1-ethyl-2,3-dimethylcyclohexane	0.033%	42.3
1-ethyl-2-propylcyclohexane	0.030%	40.0
1,2,3-trimethylcyclohexane	0.121%	45.4
(1-methylpropyl)cyclohexane	0.258%	38.5
1,2,4-trimethlycyclopentane	0.002%	43.6
1,2,4,5-tetramethylbenzene	0.421%	114.6
1,2-dimethyl-3-isopropylcyclopentane	0.022%	39.3
1-methyl-1-propylcyclopentane	0.036%	37.9
1,2,3,4-tetrahydronaphthalene	0.025%	115.1
(1-methylethyl)cyclohexane	0.143%	40.5
1,4-diethylbenzene	0.060%	89.6
1,3,5-trimethylbenzene	4.908%	138.1
1-methyl-1-phenylcyclopropane	0.013%	63.7
1,4-dimethyl-2-isopropylbenzene	0.009%	111.7
1,1,4,4-tetramethylcyclohexane	0.041%	34.3
1,2,4-trimethylcyclohexane	0.038%	45.4
1-methoxy-2-propanol	0.370%	35.5
1,4-dimethylcyclohexane	0.068%	48.2
(2-methylbutyl)cyclohexane	0.019%	39.8
1,3-dimethyl-5-propylbenzene	0.007%	132.5
1,1-dimethylcyclohexane	0.005%	42.8
1,2-dimethylcyclohexane	0.030%	48.2
1-methoxy-2-propyl acetate	0.370%	32.3
1,3-ethylmethylcyclopentane	0.003%	44.2

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Agrochemicals

1,2-ethylmethylcyclopentane	0.005%	44.2
1,3-dimethylcyclohexane	0.027%	48.2
1,3-dimethyl-4-ethylbenzene	0.059%	114.6
1,3-diethylbenzene	0.059%	104.1
1-(2-ethoxy-1-methyl-ethoxy)-2-propanol	0.370%	56.4
1-ethyl-1,4-dimethylcyclohexane	0.028%	38.7
1-(2-methoxy-1-methyl-ethoxy)-2-propanol	0.370%	53.5
1-ethylpropylbenzene	0.018%	105.7
1,1,3-trimethylcyclohexane	0.066%	41.2
(2-methylpropyl)cyclohexane	0.140%	42.7
1,2,3,4-tetramethylbenzene	0.424%	114.6

9 Seed oil extraction

Hexane is only solvent used

All emissions are hexane

Species	*% of total NMVOC*	*POCP*
hexane	100.000	48.2

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

10 Leather coating

Average of SBP solvent, toluene, ethyl acetate, 2-propanol, 2-butanone, 2-ethoxyethanol, and trichloroethene

Average of SBP solvent, toluene, ethyl acetate, 2-propanol, 2-butanone, 2-ethoxyethanol, and trichloroethene

Species	*% of total NMVOC*	*POCP*
2,3-dimethylbutane	0.143%	54.1
2-ethoxyethanol	14.286%	38.6
2,4-dimethylpentane	0.161%	46.6
2,3-dimethylpentane	0.161%	39.1
2,2-dimethylpentane	0.161%	38.6
2-butanone	14.286%	37.3
3-methylhexane	1.143%	36.4
2-propanol	14.286%	18.8
3-methylpentane	1.286%	47.9
2-methylpentane	1.429%	42.0
3,3-dimethylpentane	0.161%	37.8
2-methylhexane	1.143%	41.1
dimethylcyclopentane	0.643%	45.8
cyclohexane	1.357%	29.0
ethyl acetate	14.286%	20.9
toluene	14.286%	63.7
trichloroethene	14.286%	32.5
hexane	3.714%	48.2
methylcyclopentane	0.929%	48.1
methylcyclohexane	0.500%	51.0
heptane	1.357%	49.4

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

11 Other solvent use

see 'other solvent_99' on naei99 directory

Based on SIA data - see naei99/rawdata/datafrmt/voc/species/other solvent_99

Species	*% of total NMVOC*	*POCP*
2-methoxyethyl acetate	0.745%	40.5
2-isopropoxyethanol	0.745%	51.4
2-(2-butoxyethoxy)ethanol	0.745%	50.2
2-[2-(2-ethoxy-ethoxy)-ethoxy]ethanol	0.745%	35.7
2-butanone	4.612%	37.3
2-(2-butoxyethoxy)ethyl acetate	0.745%	40.0
2-butoxyethyl acetate	0.745%	35.1
2-butoxyethanol	0.745%	48.3
2-methoxyethanol	0.745%	30.7
2-ethoxyethyl acetate	0.745%	34.6
2-ethoxyethanol	0.745%	38.6
2-(2-ethoxyethoxy)ethyl acetate	0.745%	34.6
2-(2-ethoxyethoxy)ethanol	0.745%	49.3
2-(methoxyethoxy)ethanol	0.745%	42.8
4-methyl-2-pentanone	4.193%	49.0
dichloromethane	12.657%	6.8
diethylbenzene	0.243%	105.7
butyl acetate	3.024%	26.9
ethyldimethylbenzene	1.945%	132.0
ethyl acetate	4.234%	20.9
ethylbenzene	1.216%	73.0
acetone	25.155%	9.4
m-xylene	3.343%	110.8
propylbenzene	0.243%	63.6
trichloroethene	4.822%	32.5
o-xylene	0.729%	105.3
p-xylene	0.790%	101.0
tetrachloroethene	0.603%	2.9
naphthalene	0.304%	97.7
toluene	6.079%	63.7
indan	0.122%	79.7
methylpropylbenzene	0.790%	105.7
methylethylbenzene	2.067%	94.1
methylindane	0.243%	80.0
unspeciated aromatic hydrocarbons	0.790%	95.4

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Other solvent use

unspeciated ketones	0.419%	42.0
1,2,4-trimethylbenzene	2.553%	127.8
1-methoxy-2-propyl acetate	0.745%	32.3
1,2,3,5-tetramethylbenzene	0.709%	136.0
1-(2-ethoxy-1-methyl-ethoxy)-2-propanol	0.745%	56.4
1,2,3-trimethylbenzene	0.790%	126.7
1-(2-methoxy-1-methyl-ethoxy)-2-propanol	0.745%	53.5
1,2,3,4-tetramethylbenzene	0.284%	114.6
1-ethoxy-2-propyl acetate	0.745%	35.2
1-methoxy-2-propanol	0.745%	35.5
1,2,4,5-tetramethylbenzene	0.466%	114.6
1,3,5-trimethylbenzene	0.608%	138.1
1-ethoxy-2-propanol	0.745%	49.7
1,1,1-trichloroethane	1.808%	0.9

12 Crude oil production

US EPA profile number 1011

US EPA profile number 1011

Species	*% of total NMVOC*	*POCP*
2,2-dimethylpropane	0.269%	17.3
2,3-dimethylbutane	1.079%	54.1
2,2-dimethylbutane	0.825%	24.1
2-methylbutane	3.706%	40.5
2-methylpropane	0.641%	30.7
3-methylpentane	2.491%	47.9
2-methylpentane	3.681%	42.0
C7 cycloalkanes	2.564%	51.0
ethane	10.256%	12.3
C8 alkanes	13.942%	42.2
C7 alkanes	18.590%	42.3
butane	11.859%	35.2
benzene	0.160%	21.8
C8 cycloalkanes	0.962%	48.1
pentane	4.999%	39.5
hexane	7.790%	48.2
propane	16.186%	17.6

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

13 Crude oil distribution

US EPA profile number 0305

US EPA profile number 0305

Species	*% of total NMVOC*	*POCP*
ethane	3.799%	12.3
butane	31.006%	35.2
octane	9.856%	45.3
propane	16.222%	17.6
heptane	11.088%	49.4
hexane	9.035%	48.2
pentane	18.994%	39.5

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

14 Oil refineries

Species profile based on benzene as reported by UKPIA, plus other VOCs based on average of 7 US EPA profiles for refinery type sources

Composite profile based on US EPA data - see naei99/rawdata/datafrmt/voc/species/refinery.xls

Species	*% of total NMVOC*	*POCP*
2-ethyltoluene	0.030%	89.8
2,2-dimethylbutane	0.246%	24.1
2,3,4-trimethylpentane	0.076%	25.7
2,3-dimethylbutane	0.792%	54.1
2,2-dimethylpropane	0.169%	17.3
2,2,4-trimethylpentane	0.111%	24.7
2-methylheptane	0.122%	44.6
1-pentene	0.136%	97.7
2,4-dimethylpentane	0.248%	46.6
2-methylbutane	5.353%	40.5
2,3-dimethylpentane	0.160%	39.1
3-methylpentane	1.205%	47.9
2-methylpentane	1.617%	42.0
3-methylhexane	0.215%	36.4
2-methylhexane	0.182%	41.1
3-methylheptane	0.068%	45.0
2-methylpropane	6.250%	30.7
3-ethyltoluene	0.079%	101.9
ethylbenzene	0.177%	73.0
cyclohexane	0.345%	29.0
acetylene	0.134%	8.5
ethylcyclohexane	0.017%	48.3
C10 alkanes	0.348%	38.7
benzene	2.292%	21.8
C7 alkanes	1.565%	42.3
cyclopentane	0.213%	51.5
C7 cycloalkanes	2.877%	51.0
C9 cycloalkanes	0.142%	41.4
ethane	5.888%	12.3
cis-2-pentene	0.049%	112.1
butane	16.688%	35.2
C8 cycloalkanes	0.838%	48.1
decane	1.031%	38.4
C9 alkanes	0.569%	40.4
cis-2-butene	0.062%	114.6

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Oil refineries

C8 alkanes	0.569%	42.2
ethylene	0.435%	100.0
hexane	8.050%	48.2
p-xylene	0.342%	101.0
toluene	1.491%	63.7
unspeciated	10.342%	51.3
pentane	12.658%	39.5
trans-2-pentene	0.096%	111.7
methylcyclohexane	0.256%	51.0
methylcyclopentane	0.506%	48.1
propylbenzene	0.028%	63.6
trans-2-butene	0.087%	113.2
propane	11.937%	17.6
m-xylene	0.442%	110.8
propylene	0.613%	112.3
heptane	2.369%	49.4
nonane	0.850%	41.4
isoprene	0.009%	109.2
octane	2.429%	45.3
isopropylbenzene	0.021%	50.0
styrene	0.011%	14.2
o-xylene	0.309%	105.3
undecane	0.060%	38.4
1-butene	0.267%	107.9
1,3,5-trimethylbenzene	0.052%	138.1
1,2,4-trimethylbenzene	0.115%	127.8

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

15 Chemical industry

Speciation based on data from Pollution Inventory and from SEPA

Based on data from Pollution Inventory and SEPA - see naei99/rawdata/datafrmt/voc/species/chemical.xls and chemicals_speciation.mdb

Species	*% of total NMVOC*	*POCP*
2,2,5-trimethylhexane	0.000%	37.6
2,4-dimethylhexane	0.033%	46.5
2-methyldecalin	0.000%	41.4
1-methyl-3-propylbenzene	0.000%	104.1
2-butanol	0.271%	44.7
2-aminoethanol	0.000%	51.3
2,3-dimethylbutane	0.038%	54.1
2,2,4-trimethylpentane	0.122%	24.7
2,4-dimethylheptane	0.000%	42.6
2-ethoxyethanol	0.001%	38.6
2,2'-iminodi(ethylamine)	0.000%	51.3
2,3-dimethyloctane	0.000%	40.2
1-pentene	0.070%	97.7
1-pentanol	0.038%	59.5
1-octene	0.015%	78.2
1-nonene	0.023%	95.6
2,3-dimethylpentane	0.044%	39.1
2-butoxyethanol	0.000%	48.3
1-methyl-3-isopropylcyclopentane	0.000%	39.1
1-methylindene	0.000%	136.2
2,4,6-trichloro-1,3,5-triazine	0.000%	51.3
2,4-difluoroaniline	0.000%	0.0
2,2,3,3-tetramethylhexane	0.000%	19.2
2,3-dimethylhexane	0.177%	46.5
2-methylbutane	0.320%	40.5
2,2'-iminodiethanol	0.000%	51.3
1-methyl-3-(isopropyl)benzene	0.000%	104.1
2-butanone	0.614%	37.3
2,4-dimethyl-1-(1-methylethyl)benzene	0.000%	111.7
2,3-dimethylheptane	0.000%	42.6
2-methyldecane	0.000%	37.5
2-methyl-1-pentene	0.013%	107.2
2-methyl-1-propanol	0.033%	36.0
2-chloroethanol	0.000%	30.3

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Chemical industry

2-chlorotoluene	0.000%	13.1
2,2,4,6,6-pentamethylheptane	0.001%	21.4
2,3-dimethylnonane	0.000%	37.7
2-methoxyethanol	0.000%	30.7
2-ethyltoluene	0.042%	89.8
2,3-dimethylundecane	0.000%	31.7
2-methyl-1-butylbenzene	0.000%	86.2
2-(2-hydroxy-ethoxy)ethanol	0.000%	40.1
2,7-dimethyloctane	0.000%	39.9
1-methyl-4-isopropylbenzene	0.000%	89.6
2,3,3,4-tetramethylpentane	0.000%	37.2
2-hydrophenol	0.000%	78.2
2,6-toluene diisocyanate	0.024%	51.3
1-methyl-4-tertbutylbenzene	0.000%	87.3
1-methyl-2-propylbenzene	0.000%	88.4
2,6-dimethyldecane	0.000%	35.1
2,2-dimethylbutane	0.016%	24.1
2,6-dimethylundecane	0.000%	31.7
2-methyl-1-butene	0.026%	77.1
2-methyl-1,3-dioxolane	0.003%	46.2
2,6-dimethylheptane	0.000%	42.3
2-methoxypropane	0.007%	39.4
2,2-dimethylhexane	0.023%	38.6
1-methyl-4-isopropylcyclohexane	0.000%	43.0
2,6-dimethyloctane	0.000%	40.2
2-methyl-5-ethyloctane	0.000%	38.0
1-methyl-2-isopropylbenzene	0.000%	88.4
2-methyl-2-hexene	0.050%	81.3
2-methoxy-2-methylpropane	0.006%	17.5
2,3,4-trimethylhexane	0.000%	42.9
2,3,5-trimethylhexane	0.000%	42.6
2-methylheptane	0.022%	44.6
2-(2-aminoethylamino)ethanol	0.000%	51.3
2-methyl-2-butene	0.005%	84.2
2-ethyl-1,3-dimethylbenzene	0.000%	114.6
2,5-dimethylheptane	0.012%	51.2
2,3,4-trimethylpentane	0.058%	25.7
2,4-toluene diisocyanate	0.024%	51.3
2,3,3-trimethyl-1-butene	0.000%	81.3

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Chemical industry

1-methylbutylbenzene	0.000%	105.7
2-methylbutanal	0.000%	86.0
2,5-dimethylhexane	0.019%	44.6
1-methylindan	0.000%	80.0
2,5-dimethyloctane	0.000%	40.2
2,4-dimethylpentane	0.033%	46.6
2,5-dimethyldecane	0.000%	34.6
3,3-dimethyloctane	0.000%	35.8
3-methylheptane	0.026%	45.0
3-methylpentane	0.078%	47.9
2-propen-1-ol	0.000%	74.6
3-methylundecane	0.000%	35.1
3A,4,7,7A-tetrahydro-4,7-methanoindene	0.002%	72.0
4,4'-methylenedianiline	0.000%	51.3
3,4-dimethylheptane	0.000%	42.6
2-methyloctane	0.000%	42.8
2-propyl acetate	0.019%	21.1
4,4-dimethylheptane	0.000%	37.2
6-ethyl-2-methyloctane	0.000%	38.0
4,5-dimethylnonane	0.000%	37.9
5-methylundecane	0.000%	35.1
4,6-dimethylindan	0.000%	132.5
3,5-dimethyloctane	0.000%	40.5
4,7-dimethylindan	0.000%	132.5
4-4'-methylenediphenyl diisocyanate	0.000%	51.3
4-bromophenyl acetate	0.000%	51.3
4-chlorotoluene	0.000%	13.1
4-ethyl morpholine	0.000%	51.3
2-methylhexane	0.056%	41.1
4-ethyl-1,2-dimethylbenzene	0.000%	114.6
3,3-dimethylheptane	0.000%	37.2
4-ethyloctane	0.000%	44.4
3,3,4-trimethylhexane	0.000%	37.6
4-ethyltoluene	0.001%	90.6
4-methyl-1-pentene	0.008%	66.0
3,3,5-trimethylheptane	0.000%	36.2
2-methylnonane	0.000%	39.9
3-chloropyridine	0.000%	51.3
4-methyl-2-pentanone	0.399%	49.0

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Chemical industry

3-ethylheptane	0.000%	43.1
2-phenylpropene	0.000%	14.2
3-ethylhexane	0.000%	41.5
2-methylpyridine	0.000%	51.3
3-ethyloctane	0.000%	44.4
3-ethylpentane	0.019%	47.7
2-methylpropene	0.072%	62.7
3-ethyl-2-methylheptane	0.000%	39.9
3-ethyltoluene	0.113%	101.9
3-hydrophenol	0.000%	78.2
3-methyl-1-butene	0.005%	67.1
3,4-dimethylhexane	0.000%	45.3
3-methyldecane	0.000%	37.7
2-methylundecane	0.000%	35.2
3-chloropropene	0.000%	46.0
3-chloro-4-fluoropicoline	0.000%	51.3
3-ethyl-2-methylhexane	0.000%	43.1
5-methyldecane	0.000%	37.7
2-methylpropanal	0.002%	51.4
2-methylpentane	0.125%	42.0
3,7-dimethylnonane	0.000%	37.9
3,6-dimethyloctane	0.000%	40.5
3-methylhexane	0.055%	36.4
2-propanol	1.393%	18.8
3-methylnonane	0.000%	40.2
6-ethyl-2-methyldecane	0.000%	32.8
3-methyloctane	0.013%	42.6
2-methylpropane	0.026%	30.7
4-propylheptane	0.000%	40.5
4-methylheptane	0.000%	45.0
4-methylpentene	0.135%	66.0
4-methyldecane	0.000%	37.7
4-methylnonane	0.000%	40.2
4-methyloctane	0.016%	42.3
ethylamine	0.089%	51.3
dichloromethane	2.319%	6.8
C9 cycloalkanes	0.000%	41.4
chloromethane	2.064%	0.5
aniline	0.331%	51.3

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Chemical industry

acrylonitrile	0.941%	0.0
C10 alkanes	0.000%	38.7
ethyl acrylate	0.409%	41.4
dimethyl ether	0.183%	18.9
ethyl chloroformate	0.000%	10.1
butylbenzene	0.056%	69.0
C11 alkanes	0.000%	36.4
diethyl ether	0.020%	44.5
benzene	0.680%	21.8
ethylene oxide	0.435%	2.4
chlorobenzene	0.019%	9.9
6-methylundecane	0.000%	35.1
cycloheptane	0.000%	53.4
carbonyl sulphide	0.484%	0.0
diethylamine	0.000%	51.3
formaldehyde	0.515%	51.9
dimethylformamide	0.057%	51.3
C11 cycloalkanes	0.000%	38.4
C12 alkanes	0.000%	35.7
chlorobutane	0.010%	17.6
fenitrothion	0.000%	51.3
butene	0.388%	99.6
bromomethane	0.245%	0.6
cyclohexanone	0.004%	29.9
butyl acrylate	0.001%	47.9
ethylene	9.936%	100.0
bromoethene	0.000%	12.2
cis-2-hexene	0.009%	106.9
diisopropylbenzene	0.006%	82.2
dimethoxymethane	0.003%	16.4
ethofumesate	0.000%	51.3
acetaldehyde	0.060%	64.1
dimethylnonane	0.000%	38.4
cyclohexanol	0.000%	51.8
ethanol	1.116%	39.9
diisopropyl ether	0.403%	39.8
ethyl acetate	0.479%	20.9
dichlorvos	0.000%	51.3
butane	2.713%	35.2

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Chemical industry

ethanethiol	0.000%	0.0
benzaldehyde	0.010%	-9.2
atrazine	0.000%	0.0
chlorocyclohexane	0.000%	34.8
ethylbenzene	1.043%	73.0
ethylisopropylbenzene	0.000%	105.7
acetyl chloride	0.001%	0.2
C8 alkanes	0.000%	42.2
C13 alkanes	0.000%	31.7
carbon tetrachloride	0.026%	0.0
C12 cycloalkanes	0.000%	35.7
diethyl sulphate	0.000%	0.0
decane	0.009%	38.4
decalin	0.000%	44.4
cis-2-butene	0.010%	114.6
cis-2-pentene	0.022%	112.1
dimethylbutene	0.022%	59.9
bis(tributyltin) oxide	0.001%	0.0
cis-1,3-dimethylcyclopentane	0.013%	45.8
dimethylamine	0.023%	51.3
dimethyl disulphide	0.012%	0.0
acetonitrile	0.074%	0.0
acetic anhydride	0.007%	2.5
butylcyclohexane	0.006%	42.5
bis(chloromethyl)ether	0.000%	29.2
ethylcyclohexane	0.000%	48.3
benzene-1,2,4-tricarboxylic acid 1,2-anhydride	0.000%	51.3
dimethyl sulphate	0.000%	0.0
C9 alkanes	0.000%	40.4
cyclopentene	0.009%	106.8
ethane	1.097%	12.3
cyclohexanamine	0.000%	51.3
acetone	6.043%	9.4
acetylene	0.042%	8.5
C10 cycloalkanes	0.000%	38.4
diazinon	0.000%	51.3
ethylene glycol	1.863%	37.3
benzo (a) pyrene	0.000%	0.0
diacetoneketogulonic acid	0.001%	0.0

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Chemical industry

benzophenone	0.000%	51.3
chloroethane	3.815%	10.4
acetic acid	1.783%	9.7
C11 aromatic hydrocarbons	0.000%	134.2
cyclopentane	0.012%	51.5
difluoromethane	0.069%	0.6
acrylamide	0.043%	51.3
biphenyl	0.000%	66.6
butyl acetate	0.021%	26.9
benzyl chloride	0.003%	17.7
cyclohexane	3.327%	29.0
dodecane	0.052%	35.7
chloroethene	0.343%	36.1
acrylic acid	0.248%	34.4
indan	0.000%	79.7
sodium phenylacetate	0.000%	51.3
m-xylene	2.753%	110.8
propionitrile	0.010%	0.0
toluene-2,4-diisocyanate	0.000%	51.3
propanoic acid	0.202%	15.0
potassium phenylacetate	0.000%	51.3
methanethiol	0.002%	0.0
malathion	0.000%	51.3
methacrylic acid	0.033%	50.2
sodium acetate	0.000%	0.0
simazine	0.000%	0.0
methanol	1.882%	14.0
styrene	0.548%	14.2
propane	4.315%	17.6
methyl acetate	13.026%	5.9
isopentylbenzene	0.000%	67.3
toluene-3,4-diamine	0.000%	51.3
propylcyclohexane	0.000%	45.4
polyvinyl chloride	0.000%	0.0
toluene-2,6-diisocyanate	0.000%	51.3
toluene-2,6-diamine	0.000%	51.3
propylcyclopentane	0.000%	44.5
isopropylbenzene	0.010%	50.0
propylbenzene	0.031%	63.6

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Chemical industry

sodium 2-ethylhexanoate	0.000%	51.3
isoprene	0.002%	109.2
propylamine	0.000%	51.3
iodomethane	0.002%	0.7
toluene-2,5-diamine	0.000%	51.3
propylene oxide	0.119%	13.4
pyridine	0.000%	51.3
salicylic acid	0.000%	44.8
toluene-3,5-diamine	0.000%	51.3
trans-2-butene	0.011%	113.2
m-cresol	0.000%	68.0
propylene	9.499%	112.3
N-methyl pyrrolidone	0.001%	51.3
methylcyclodecane	0.000%	39.3
undecane	0.009%	38.4
trimethylamine	0.000%	51.3
trifluralin	0.000%	51.3
methyltetralin	0.000%	114.0
octane	0.020%	45.3
N,N-diethyl benzenamine	0.001%	51.3
N,N-dimethyl benzenamine	0.017%	51.3
octahydroindan	0.000%	44.5
N-(hydroxymethyl) acrylamide	0.000%	51.3
p-benzoquinone	0.000%	51.6
trifluoromethane	0.181%	0.0
p-cresol	0.000%	65.5
trifluoroethene	0.002%	54.7
triethylamine	0.000%	51.3
naphthalene	0.000%	97.7
Nedocromil Sodium	0.000%	0.0
nitrobenzene	0.031%	0.0
nitromethane	0.004%	0.0
tridecane	0.003%	32.7
nonane	0.018%	41.4
o-xylene	0.684%	105.3
o-cresol	0.000%	67.3
trichloromethane	0.135%	2.3
trichloroethene	0.072%	32.5
sulphanilamide	0.000%	0.0

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Chemical industry

methyl acrylate	0.073%	39.1
phthalic anhydride	0.107%	105.3
phenylacetonitrile	0.001%	51.3
phenylacetic acid	0.000%	15.2
phenoxyacetic acid (phenoxy acid)	0.037%	15.2
unspeciated	4.102%	51.3
methyl formate	0.201%	2.7
phenol	0.312%	63.3
trans-2-hexene	0.016%	107.3
methyl methacrylate	0.223%	46.7
octylamine	0.000%	51.3
methylamine	0.001%	0.0
polyisobutene	0.011%	0.0
pentylcyclohexane	0.000%	39.6
maleic anhydride	0.006%	26.8
trans-2-pentene	0.040%	111.7
pentylbenzene	0.000%	67.3
methylcyclohexane	0.025%	51.0
pentane	1.350%	39.5
pentafluoroethane	0.001%	0.1
methylcyclopentane	0.048%	48.1
palmitic acid	0.000%	27.2
p-xylene	0.755%	101.0
trans-3-hexene	0.011%	107.2
permethrin	0.000%	51.3
tetramethylcyclohexane	0.000%	38.5
toluene-2,3-diamine	0.000%	51.3
tert-butylcyclopropane	0.000%	11.5
tetradecane	0.000%	30.7
heptane	0.079%	49.4
tetrachloroethene	0.298%	2.9
hexane	3.884%	48.2
toluene-2,4-diamine	0.000%	51.3
toluene	1.502%	63.7
glycerol	0.001%	39.2
hexamethyldisiloxane	0.000%	0.0
hexamethyldisilane	0.000%	0.0
hexafluoropropene	0.000%	69.4
hexachlorocyclohexane	0.003%	2.3

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Chemical industry

hexylcyclohexane	0.000%	36.7
tert-pentylbenzene	0.000%	67.3
hexamethylenediamine	0.438%	51.3
formic acid	0.188%	3.2
fumaric acid	0.000%	17.1
tetrafluoroethene	0.076%	9.4
formanilide	0.153%	0.0
tert-butylamine	0.008%	51.3
tetrahydrofuran	0.224%	57.0
vinyl acetate	0.393%	48.5
unspeciated hydrocarbons	0.321%	71.9
urea	0.000%	0.0
unspeciated cycloalkanes	0.000%	43.4
unspeciated alkanes	0.000%	36.8
1,2-ethylmethylcyclopentane	0.000%	44.2
1-ethyl-2,3-dimethylcyclohexane	0.000%	42.3
1,3-dimethyl-5-propylbenzene	0.000%	132.5
1,2,3-trimethylcyclohexane	0.000%	45.4
1,3-diethylbenzene	0.016%	104.1
1-ethyl-2,3-dimethylbenzene	0.000%	114.6
1,1,2,2-tetrachloroethane	0.000%	7.7
1,2,3-trimethylcyclopentane	0.000%	43.6
(2-methylpropyl)cyclohexane	0.000%	42.7
1,3,4,5,6-pentahydroxy-2-hexanone	0.010%	0.0
1,3-dimethyl-4-ethylbenzene	0.019%	114.6
1,3,5-trichlorobenzene	0.000%	17.3
1,3,5-trimethylbenzene	0.119%	138.1
1,3-butadiene	0.512%	85.1
1,2-diaminoethane	0.001%	51.3
1,2,4-trimethylbenzene	0.238%	127.8
1-butanol	0.043%	62.0
1-butene	0.177%	107.9
1,2,4-trimethlycyclopentane	0.000%	43.6
1-ethyl-2-propylbenzene	0.000%	86.2
1,4-dioxane	0.001%	38.4
1,2,4-trichlorobenzene	0.000%	15.3
1,1,1-trichloroethane	0.001%	0.9
(1-methylpropyl)cyclohexane	0.000%	38.5
1,4-dimethylpiperazine	0.000%	51.3

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Chemical industry

1-chloro-2,3-epoxypropane	0.556%	10.2
1-chloro-4-nitrobenzene	0.077%	0.0
1,4-dichlorobenzene	0.000%	5.0
1,4-dimethylcyclohexane	0.000%	48.2
1,2,4,4-tetramethylcyclopentane	0.000%	37.5
1,4-dimethyl-2-isopropylbenzene	0.000%	111.7
1,2,4,5-tetramethylbenzene	0.020%	114.6
1,2-dibromoethane	0.002%	3.3
1,2-dichlorobenzene	0.001%	12.0
1,2-dichloroethane	0.764%	7.0
1,2-dimethyl-3-isopropylcyclopentane	0.000%	39.3
1,4-diethylbenzene	0.000%	89.6
1-ethyl-1,4-dimethylcyclohexane	0.000%	38.7
(2-methylbutyl)cyclohexane	0.000%	39.8
1,3-ethylmethylcyclopentane	0.000%	44.2
1,2-dimethylcyclohexane	0.000%	48.2
1,3-dimethylcyclohexane	0.000%	48.2
1-ethyl-2,2,6-trimethylcyclohexane	0.000%	37.2
1,2,4-trimethylcyclohexane	0.000%	45.4
1,1,4,4-tetramethylcyclohexane	0.000%	34.3
1,1-dichloroethene	0.000%	52.6
1,2,3-trimethylbenzene	0.101%	126.7
1,2,3-trichlorobenzene	0.000%	2.2
1,1-dimethylcyclohexane	0.000%	42.8
1-ethyl-3,5-dimethylbenzene	0.000%	136.0
1-ethyl-2-propylcyclohexane	0.000%	40.0
1-ethyl-3-methylcyclohexane	0.000%	45.6
1-hydrophenol	0.000%	78.2
1-methyl-1-propylcyclopentane	0.000%	37.9
(1-methylethyl)cyclohexane	0.000%	40.5
1,2,3,5-tetramethylcyclohexane	0.000%	42.7
1,2,3,5-tetramethylbenzene	0.026%	136.0
1-ethyl-4-methylcyclohexane	0.000%	45.6
1-heptene	0.002%	83.1
1,1,3-trimethylcyclohexane	0.000%	41.2
1,1,2-trimethylcyclohexane	0.000%	41.2
1,2,3,4-tetramethylbenzene	0.009%	114.6
1-methyl-1-phenylcyclopropane	0.000%	63.7
1,2,3,4-tetrahydronaphthalene	0.000%	115.1

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

1-hexene	0.024%	87.4
1-ethylpropylbenzene	0.000%	105.7

19 Bread baking

Based on data in Keller, 1978 - see speciation report for details

Based on Keller, 1978

Species	*% of total NMVOC*	*POCP*
acetaldehyde	2.500%	64.1
ethanol	95.000%	39.9
unspeciated alcohols	2.500%	36.4

20 Alcoholic beverages - fermentation

USEPA profile no 1188. Emissions from fermentation units at whiskey distillery

USEPA profile no 1188. Emissions from fermentation units at whiskey distillery

Species	*% of total NMVOC*	*POCP*
2-methyl-1-propanol	0.030%	36.0
3-methylbutanol	0.090%	43.3
ethyl acetate	0.320%	20.9
ethanol	99.560%	39.9

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

22 Landfill

Profile based on mean of range for each compound given in DoE Waste Management Paper No 26

DoE Waste Management Paper No 26 - see naei99/rawdata/datafrmt/voc/species/landfill

Species	*% of total NMVOC*	*POCP*
2-methyl-2-butene	0.000%	84.2
2-butene	0.435%	113.9
1-pentene	0.001%	97.7
2,5-dimethylfuran	0.032%	62.8
2,2-dimethylpropane	0.026%	17.3
1-propanol	0.887%	56.1
2-butanone	0.309%	37.3
2-chloropropane	0.004%	14.5
2,4-dimethylfuran	0.032%	62.8
2,3-dimethylfuran	0.032%	62.8
2-butanol	1.693%	44.7
2-methyl-1-propanol	0.043%	36.0
2,2-dimethylbutane	0.264%	24.1
2,3-dimethylbutane	0.345%	54.1
2-methylbutane	0.355%	40.5
2-methyl-1-butene	0.000%	77.1
2-methylfuran	0.003%	59.6
2-pentene	0.001%	111.9
2-pentanone	0.034%	54.8
3-methyl-1-butene	0.000%	67.1
2-propanol	0.371%	18.8
2-methylpropane	0.171%	30.7
2-methylpentane	1.177%	42.0
3-methylfuran	0.003%	59.6
2-propyl acetate	0.048%	21.1
2-methylpropene	0.109%	62.7
3-methylpentane	0.796%	47.9
chlorodifluoromethane	0.129%	0.2
C6 alkenes	1.096%	95.7
diethyl disulphide	0.005%	0.0
bromoethane	0.008%	1.3
butanethiols	0.019%	0.0
C8 alkanes	5.509%	42.2
C7 alkenes	0.848%	95.9
cyclopentane	0.054%	51.5

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Landfill

diisopropyl ether	0.887%	39.8
dipropyl ether	0.887%	53.1
ethanol	6.528%	39.9
chloroethane	0.371%	10.4
C10 alkanes	3.353%	38.7
ethanethiol	0.008%	0.0
acetone	0.027%	9.4
benzene	0.922%	21.8
diethyl ether	0.097%	44.5
C7 alkanes	8.527%	42.3
dimethyl disulphide	0.323%	0.0
C11 aromatic hydrocarbons	0.144%	134.2
ethyl butanoate	2.821%	30.1
chlorobenzene	0.017%	9.9
ethyl pentanoate	0.218%	32.4
ethyl propionate	1.096%	19.9
dichlorofluoromethane	0.750%	1.3
chloromethane	0.008%	0.5
ethylbenzene	2.797%	73.0
butylcyclohexane	0.008%	42.5
C8 alkenes	1.161%	93.7
butyl acetate	0.484%	26.9
dichlorodifluoromethane	0.387%	0.0
dichlorobutenes	0.008%	34.7
camphor/fenchone	0.105%	74.5
carbon disulphide	0.016%	0.0
cyclohexane	0.830%	29.0
carbonyl sulphide	0.008%	0.0
ethyl acetate	0.516%	20.9
C5 alkenes	0.016%	87.6
dimethyl ether	0.008%	18.9
C11 alkanes	1.418%	36.4
butylbenzene	0.290%	69.0
chloroethene	0.258%	36.1
C11 alkenes	0.435%	84.5
C9 alkenes	0.719%	90.8
chlorofluoromethane	0.081%	1.9
C10 alkenes	1.620%	87.8
butane	0.554%	35.2

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Landfill

C9 alkanes	2.071%	40.4
dichloromethane	1.531%	6.8
dimethyl sulphide	0.484%	0.0
ethylcyclopentane	0.008%	46.6
p-xylene	1.345%	101.0
isobutylbenzene	0.290%	57.8
isobutylcyclohexane	0.008%	36.3
propane	0.008%	17.6
hexane	2.490%	48.2
methyl ethyl ether	0.008%	25.3
pentane	0.479%	39.5
methyl styrene	0.121%	14.2
trichloromethane	0.006%	2.3
methanethiol	0.701%	0.0
methyl pentanoate	0.177%	31.9
isopropylbenzene	1.322%	50.0
propylcyclohexane	0.032%	45.4
trichlorofluoromethane	0.161%	0.0
limonene	1.951%	74.5
methylcyclopentane	0.637%	48.1
methanol	1.693%	14.0
m-xylene	1.734%	110.8
propyl propionate	1.612%	28.5
styrene	0.056%	14.2
propyl acetate	0.403%	28.2
terpenes	2.622%	74.5
toluene	3.772%	63.7
sec-butylcyclohexane	0.008%	42.6
sec-butylbenzene	0.290%	68.9
menthene	0.234%	89.9
tert-butylcyclohexane	0.008%	39.5
propylbenzene	1.322%	63.6
pentanethiols	0.010%	0.0
tetrahydrofuran	0.008%	57.0
methyl butanoate	0.121%	29.6
o-xylene	0.983%	105.3
trichloroethene	1.370%	32.5
tert-butylbenzene	0.290%	53.4
isopropylcyclohexane	0.032%	38.0

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Landfill

tetrachloroethene	2.821%	2.9
methylcyclohexane	2.349%	51.0
propyl butanoate	0.806%	31.9
unspeciated carboxylic acids	0.008%	15.2
1,2-dichloroethane	0.064%	7.0
1,1-dichlorotetrafluoroethane	0.008%	0.0
1,3-dichlorobenzene	0.043%	14.7
1,2,4-trimethylcyclohexane	0.054%	45.4
1,4-dichlorobenzene	0.043%	5.0
1,2-dichlorotetrafluoroethane	0.081%	0.0
1-chloropropane	0.004%	15.3
1-butanol	0.153%	62.0
1,2,4-trimethylcyclopentane	0.156%	42.8
1,3-dimethylcyclohexane	0.101%	48.2
1,2-dichlorobenzene	0.043%	12.0
1,4-dimethylcyclohexane	0.232%	48.2
1,2,3-trimethylcyclopentane	0.156%	43.6
1-butene	0.181%	107.9
1,1,1-trichloroethane	1.427%	0.9
1,2-dimethylcyclopentane	0.887%	45.9
1,1-dimethylcyclopentane	0.887%	28.8
1,2-dichloroethene	2.434%	42.0
1,2-dimethylcyclohexane	0.101%	48.2
1,1,2-trimethylcyclohexane	0.054%	41.2
1,3-butadiene	0.161%	85.1
1,1,1-trichlorotrifluoroethane	0.564%	0.0
1,1-dichloroethane	1.048%	9.4
1,3-dioxolane	0.040%	50.9
1,3,5-trimethylcyclohexane	0.054%	45.4
1,2,3-trimethylcyclohexane	0.054%	45.4
1,3-dimethylcyclopentane	0.887%	45.9
1,1,2-trimethylcyclopentane	0.156%	40.8

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

30 Electricity generation using coal

US EPA profile number 1178

US EPA profile number 1178

Species	*% of total NMVOC*	*POCP*
2-methylbutane	1.220%	40.5
2,4-dimethylpentane	6.390%	46.6
ethylbenzene	11.250%	73.0
ethane	2.090%	12.3
cis-2-pentene	1.050%	112.1
butane	0.980%	35.2
o-xylene	8.660%	105.3
hexane	9.450%	48.2
toluene	5.620%	63.7
heptane	1.500%	49.4
propane	1.780%	17.6
m-xylene	39.230%	110.8
1-decene	2.670%	91.7
1-hexene	3.630%	87.4
1-heptene	3.690%	83.1
1-butene	0.790%	107.9

31 Industrial combustion of oil (residual oil)

US EPA profile number 0001

US EPA profile number 0001

Species	*% of total NMVOC*	*POCP*
acetone	31.461%	9.4
butane	15.730%	35.2
formaldehyde	47.191%	51.9
hexane	5.618%	48.2

32 Electricity generation using gas

US EPA profile number 0007

US EPA profile number 0007

Species	*% of total NMVOC*	*POCP*
formaldehyde	100.000	51.9

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

33 Industrial combustion of coal

US EPA profile number 1185

US EPA profile number 1185

Species	*% of total NMVOC*	*POCP*
2-methylbutane	1.240%	40.5
2-methylpropane	3.001%	30.7
butane	6.381%	35.2
ethane	17.794%	12.3
benzene	3.781%	21.8
acetylene	15.433%	8.5
ethylbenzene	5.671%	73.0
toluene	8.392%	63.7
p-xylene	5.128%	101.0
m-xylene	6.634%	110.8
propane	5.201%	17.6
hexane	7.802%	48.2
methylcyclopentane	2.901%	48.1
o-xylene	2.601%	105.3
propylene	0.770%	112.3
pentane	1.180%	39.5
1-butene	6.091%	107.9

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

34 Industrial combustion of oil (distillate oil)

US EPA profile number 0002

US EPA profile number 0002

Species	*% of total NMVOC*	*POCP*
2,3-dimethylbutane	0.369%	54.1
2-methylbutane	2.715%	40.5
2,2-dimethylpropane	0.195%	17.3
2,2-dimethylbutane	0.278%	24.1
2-methylpropane	2.169%	30.7
2-methylpentane	1.257%	42.0
3-methylpentane	0.847%	47.9
acetone	14.815%	9.4
C8 alkanes	2.487%	42.2
formaldehyde	47.989%	51.9
butane	13.862%	35.2
C7 alkanes	1.376%	42.3
pentane	2.487%	39.5
propane	0.635%	17.6
heptane	0.159%	49.4
hexane	8.360%	48.2

35 Industrial combustion of gas

US EPA profile number 0003

US EPA profile number 0003

Species	*% of total NMVOC*	*POCP*
2-methylbutane	8.448%	40.5
2,3-dimethylbutane	0.155%	54.1
2,2-dimethylbutane	0.118%	24.1
2,2-dimethylpropane	0.614%	17.3
2-methylpentane	0.527%	42.0
3-methylpentane	0.357%	47.9
formaldehyde	18.182%	51.9
benzene	9.091%	21.8
butane	20.455%	35.2
cyclohexane	2.273%	29.0
toluene	4.545%	63.7
propane	9.091%	17.6
pentane	25.030%	39.5
hexane	1.116%	48.2

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

36 Domestic combustion of gas

TNO report (Veldt, 1991)

TNO report (Veldt, 1991), profile for stationary combustion, boilers, natural gas

Species	*% of total NMVOC*	*POCP*
2-methylbutane	21.000%	40.5
butane	20.000%	35.2
formaldehyde	18.000%	51.9
benzene	9.000%	21.8
cyclohexane	2.000%	29.0
hexane	2.000%	48.2
pentane	14.000%	39.5
toluene	5.000%	63.7
propane	9.000%	17.6

38 Domestic combustion of oil

TNO report (Veldt, 1991)

TNO report (Veldt, 1991), profile for stationary combustion, residential units, distillate oil/kerosene

Species	*% of total NMVOC*	*POCP*
1-propanal	20.000%	79.8
ethylene	10.000%	100.0
benzene	5.000%	21.8
acetylene	5.000%	8.5
o-xylene	0.300%	105.3
m-xylene	0.395%	110.8
p-xylene	0.305%	101.0
unspeciated	20.000%	51.3
toluene	2.000%	63.7
unspeciated aromatic hydrocarbons	2.000%	95.4
unspeciated hydrocarbons	5.000%	71.9
unspeciated alcohols	20.000%	36.4
unspeciated ketones	10.000%	42.0

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

40 2 Stroke petrol engines

CORINAIR Guidebook - section B810

CORINAIR Guidebook - section B810

Species	*% of total NMVOC*	*POCP*
acetylene	2.000%	8.5
benzene	2.000%	21.8
ethane	1.000%	12.3
ethylene	3.000%	100.0
toluene	3.000%	63.7
propane	1.000%	17.6
propylene	1.000%	112.3
unspeciated aromatic hydrocarbons	6.000%	95.4
unspeciated alkanes	72.000%	36.8
unspeciated alkenes	9.000%	97.5

41 Coke ovens

CORINAIR Guidebook - section B146

CORINAIR Guidebook - section B146

Species	*% of total NMVOC*	*POCP*
ethane	12.658%	12.3
benzene	17.722%	21.8
ethylene	13.924%	100.0
m-xylene	2.532%	110.8
p-xylene	2.532%	101.0
o-xylene	2.532%	105.3
toluene	7.595%	63.7
unspeciated alkanes	40.506%	36.8

42 Forests

100% 'isoprene + BVOC' - we need a proper profile

No speciation assumed all unspeciated: 100% 'isoprene + BVOC'

Species	*% of total NMVOC*	*POCP*
isoprene + BVOC	100.000	90.0

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

43 Wood impregnation

Based on SIA data -see naei99/rawdata/datafrmt/voc/species/wood_impregnation

Based on SIA data -see naei99/rawdata/datafrmt/voc/species/wood_impregnation

Species	*% of total NMVOC*	*POCP*
2,2,3,3-tetramethylhexane	0.002%	19.2
2,3,4-trimethylhexane	0.000%	42.9
2,5-dimethylheptane	0.001%	51.2
1-methylbutylbenzene	0.001%	105.7
2-ethoxyethyl acetate	0.300%	34.6
2-(2-butoxyethoxy)ethanol	0.524%	50.2
2,4-dimethyl-1-(1-methylethyl)benzene	0.001%	111.7
2-butanone	2.990%	37.3
1-methyl-2-propylbenzene	0.002%	88.4
2,2,5-trimethylhexane	0.000%	37.6
2-(2-ethoxyethoxy)ethyl acetate	0.300%	34.6
2-butoxyethyl acetate	0.300%	35.1
2-(2-ethoxyethoxy)ethanol	0.524%	49.3
2,7-dimethyloctane	0.002%	39.9
2,5-dimethylhexane	0.000%	44.6
2-ethoxyethanol	0.524%	38.6
2-methyl-1-butylbenzene	0.000%	86.2
2,3-dimethylheptane	0.002%	42.6
2-methyldecalin	0.001%	41.4
2,4-dimethylheptane	0.000%	42.6
2-[2-(2-ethoxy-ethoxy)-ethoxy]ethanol	0.524%	35.7
2-methylheptane	0.000%	44.6
2-ethyl-1,3-dimethylbenzene	0.002%	114.6
2,5-dimethyldecane	0.001%	34.6
1-methyl-3-propylbenzene	0.004%	104.1
2-(methoxyethoxy)ethanol	0.524%	42.8
2,3,5-trimethylhexane	0.000%	42.6
2-(2-butoxyethoxy)ethyl acetate	0.300%	40.0
1-methylindan	0.000%	80.0
2-butanol	6.969%	44.7
2,6-dimethylundecane	0.000%	31.7
1-methyl-2-isopropylbenzene	0.002%	88.4
2,6-dimethyloctane	0.008%	40.2
2,3-dimethyloctane	0.001%	40.2
2-methyl-5-ethyloctane	0.002%	38.0

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Wood impregnation

1-methyl-4-isopropylcyclohexane	0.006%	43.0
1-methyl-3-(isopropyl)benzene	0.002%	104.1
2-methyldecane	0.006%	37.5
1-methyl-3-isopropylcyclopentane	0.000%	39.1
2,6-dimethylheptane	0.001%	42.3
2-methoxyethyl acetate	0.300%	40.5
2,5-dimethyloctane	0.003%	40.2
2-methoxyethanol	0.524%	30.7
2-butoxyethanol	0.524%	48.3
2,3-dimethylundecane	0.000%	31.7
2-isopropoxyethanol	0.524%	51.4
2,3-dimethylnonane	0.002%	37.7
2,6-dimethyldecane	0.001%	35.1
1-methyl-4-tertbutylbenzene	0.001%	87.3
1-methylindene	0.000%	136.2
2,3,3,4-tetramethylpentane	0.000%	37.2
1-methyl-4-isopropylbenzene	0.006%	89.6
3-ethyloctane	0.002%	44.4
2-methylnonane	0.008%	39.9
3-ethylhexane	0.000%	41.5
4-methylnonane	0.006%	40.2
3-ethylheptane	0.002%	43.1
4,5-dimethylnonane	0.001%	37.9
4-methyl-2-pentanone	4.694%	49.0
3-methyloctane	0.003%	42.6
4-methyloctane	0.003%	42.3
6-ethyl-2-methyldecane	0.000%	32.8
4-ethyl-1,2-dimethylbenzene	0.001%	114.6
2-propyl acetate	4.196%	21.1
4,6-dimethylindan	0.000%	132.5
4-ethyloctane	0.001%	44.4
3-ethyltoluene	0.005%	101.9
3,7-dimethylnonane	0.002%	37.9
3-ethyl-2-methylheptane	0.009%	39.9
3,3,5-trimethylheptane	0.000%	36.2
3-ethyl-2-methylhexane	0.000%	43.1
3,5-dimethyloctane	0.001%	40.5
3,6-dimethyloctane	0.002%	40.5
5-methylundecane	0.001%	35.1

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Wood impregnation

3-methylundecane	0.001%	35.1
3-methylheptane	0.000%	45.0
5-methyldecane	0.003%	37.7
6-ethyl-2-methyloctane	0.000%	38.0
2-methyloctane	0.003%	42.8
3-methyldecane	0.007%	37.7
4-methylheptane	0.000%	45.0
4,7-dimethylindan	0.000%	132.5
3,4-dimethylhexane	0.000%	45.3
3,4-dimethylheptane	0.003%	42.6
4,4-dimethylheptane	0.000%	37.2
4-ethyltoluene	0.002%	90.6
4-propylheptane	0.000%	40.5
3,3,4-trimethylhexane	0.000%	37.6
3,3-dimethyloctane	0.002%	35.8
4-methyldecane	0.011%	37.7
4-methyl-4-hydroxy-2-pentanone	1.049%	30.7
3-methylnonane	0.009%	40.2
3-methylhexane	0.000%	36.4
3,3-dimethylheptane	0.000%	37.2
2-methylundecane	0.001%	35.2
ethylisopropylbenzene	0.000%	105.7
C12 cycloalkanes	0.000%	35.7
C9 cycloalkanes	0.000%	41.4
acetone	6.792%	9.4
dimethylnonane	0.001%	38.4
ethyl acetate	2.098%	20.9
C11 alkanes	0.007%	36.4
6-methylundecane	0.001%	35.1
C11 aromatic hydrocarbons	0.000%	134.2
butylbenzene	0.002%	69.0
C10 cycloalkanes	0.007%	38.4
C13 alkanes	0.000%	31.7
C11 cycloalkanes	0.000%	38.4
butyl acetate	3.147%	26.9
decane	0.038%	38.4
butylcyclohexane	0.006%	42.5
ethylcyclohexane	0.002%	48.3
C9 alkanes	0.000%	40.4

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Wood impregnation

ethylbenzene	1.534%	73.0
decalin	0.002%	44.4
C12 alkanes	0.002%	35.7
C8 alkanes	0.000%	42.2
C10 alkanes	0.006%	38.7
cycloheptane	0.000%	53.4
dodecane	0.002%	35.7
heptane	0.000%	49.4
tert-butylcyclopropane	0.000%	11.5
propylbenzene	0.003%	63.6
m-xylene	4.218%	110.8
methyltetralin	0.000%	114.0
pentylbenzene	0.000%	67.3
isopentylbenzene	0.000%	67.3
octane	0.002%	45.3
methylcyclohexane	0.000%	51.0
toluene	7.668%	63.7
octahydroindan	0.001%	44.5
naphthalene	0.000%	97.7
methylcyclodecane	0.000%	39.3
o-xylene	0.922%	105.3
isopropylbenzene	0.001%	50.0
p-xylene	0.997%	101.0
propylcyclopentane	0.000%	44.5
pentylcyclohexane	0.001%	39.6
undecane	0.000%	38.4
nonane	0.022%	41.4
tert-pentylbenzene	0.000%	67.3
tetramethylcyclohexane	0.001%	38.5
indan	0.001%	79.7
propylcyclohexane	0.008%	45.4
unspeciated	0.000%	51.3
hexylcyclohexane	0.000%	36.7
unspeciated cycloalkanes	0.000%	43.4
unspeciated hydrocarbons	0.002%	71.9
unspeciated alkanes	0.000%	36.8
1-methyl-1-propylcyclopentane	0.001%	37.9
1,4-diethylbenzene	0.002%	89.6
1-methoxy-2-propyl acetate	0.300%	32.3

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Wood impregnation

1-ethoxy-2-propanol	0.524%	49.7
1,2-dimethyl-3-isopropylcyclopentane	0.001%	39.3
1-ethyl-2-propylcyclohexane	0.001%	40.0
1,2,4-trimethylbenzene	0.011%	127.8
1,1,4,4-tetramethylcyclohexane	0.001%	34.3
1,2-dimethylcyclohexane	0.001%	48.2
1,3-dimethylcyclohexane	0.001%	48.2
1-ethyl-3-methylcyclohexane	0.005%	45.6
1,4-dimethyl-2-isopropylbenzene	0.000%	111.7
1,3,5-trimethylbenzene	0.005%	138.1
1,2,4-trimethlycyclopentane	0.000%	43.6
1,1,3-trimethylcyclohexane	0.002%	41.2
(2-methylbutyl)cyclohexane	0.000%	39.8
1-methoxy-2-propanol	0.524%	35.5
1,2,3,5-tetramethylbenzene	0.001%	136.0
1-ethoxy-2-propyl acetate	0.300%	35.2
1,2,4,5-tetramethylbenzene	0.001%	114.6
1-ethyl-2,3-dimethylcyclohexane	0.001%	42.3
1-ethyl-4-methylcyclohexane	0.002%	45.6
1,2,4-trimethylcyclohexane	0.001%	45.4
1,3-ethylmethylcyclopentane	0.000%	44.2
1,2,3,5-tetramethylcyclohexane	0.002%	42.7
1-ethyl-1,4-dimethylcyclohexane	0.001%	38.7
1,2,3-trimethylcyclopentane	0.000%	43.6
(1-methylethyl)cyclohexane	0.004%	40.5
1,2,3,4-tetramethylbenzene	0.001%	114.6
(2-methylpropyl)cyclohexane	0.004%	42.7
1-ethyl-2,3-dimethylbenzene	0.001%	114.6
1,2,3-trimethylbenzene	0.005%	126.7
1-(2-ethoxy-1-methyl-ethoxy)-2-propanol	0.524%	56.4
1,2,3,4-tetrahydronaphthalene	0.001%	115.1
1-(2-methoxy-1-methyl-ethoxy)-2-propanol	0.524%	53.5
1,2,3-trimethylcyclohexane	0.003%	45.4
1-methyl-1-phenylcyclopropane	0.000%	63.7
1,2-ethylmethylcyclopentane	0.000%	44.2
1-ethyl-3,5-dimethylbenzene	0.002%	136.0
1-ethyl-2,2,6-trimethylcyclohexane	0.002%	37.2
1-butanol	6.969%	62.0
1-ethyl-2-propylbenzene	0.000%	86.2

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Wood impregnation

1,4-dimethylcyclohexane	0.002%	48.2
1-ethylpropylbenzene	0.000%	105.7
1,3-diethylbenzene	0.001%	104.1
1,3-dimethyl-5-propylbenzene	0.000%	132.5
1,2,4,4-tetramethylcyclopentane	0.000%	37.5
1,1-dimethylcyclohexane	0.000%	42.8
1,3-dimethyl-4-ethylbenzene	0.001%	114.6
1,1,2-trimethylcyclohexane	0.001%	41.2
(1-methylpropyl)cyclohexane	0.007%	38.5

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

44 Decorative paint

naei99/rawdata/datafrmt/voc/species/decorative_paint

Developed from data provided by the coatings industry

Species	*% of total NMVOC*	*POCP*
1-methyl-4-isopropylcyclohexane	1.423%	43.0
2-methyl-5-ethyloctane	0.477%	38.0
2,3,5-trimethylhexane	0.009%	42.6
2,3-dimethyloctane	0.144%	40.2
1-methyl-2-isopropylbenzene	0.343%	88.4
2,5-dimethyloctane	0.576%	40.2
2,7-dimethyloctane	0.342%	39.9
2,2,5-trimethylhexane	0.036%	37.6
2-(2-ethoxyethoxy)ethanol	1.355%	49.3
2-(2-butoxyethoxy)ethanol	1.355%	50.2
2,5-dimethyldecane	0.180%	34.6
2,5-dimethylheptane	0.216%	51.2
1-methyl-4-tertbutylbenzene	0.229%	87.3
2,6-dimethylheptane	0.234%	42.3
2-ethyl-1,3-dimethylbenzene	0.438%	114.6
2,5-dimethylhexane	0.009%	44.6
1-methyl-2-propylbenzene	0.404%	88.4
2,3,3,4-tetramethylpentane	0.009%	37.2
2,6-dimethylundecane	0.054%	31.7
1-methylbutylbenzene	0.222%	105.7
2,3,4-trimethylhexane	0.036%	42.9
2,6-dimethyldecane	0.225%	35.1
1-methyl-4-isopropylbenzene	1.373%	89.6
1-methyl-3-isopropylcyclopentane	0.009%	39.1
1-methylindene	0.009%	136.2
2,3-dimethylundecane	0.081%	31.7
2,4-dimethyl-1-(1-methylethyl)benzene	0.269%	111.7
2,3-dimethylheptane	0.459%	42.6
2-methyldecalin	0.333%	41.4
2,4-dimethylheptane	0.072%	42.6
2,3-dimethylnonane	0.342%	37.7
2-methylheptane	0.072%	44.6
2,2,4-trimethyl-1,3-pentanediol monoisobutyrate	1.355%	27.5
2,6-dimethyloctane	1.720%	40.2
1-methyl-3-propylbenzene	0.801%	104.1
1-methylindan	0.101%	80.0

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Decorative paint

2,2,3,3-tetramethylhexane	0.540%	19.2
2-methyl-1-butylbenzene	0.027%	86.2
1-methyl-3-(isopropyl)benzene	0.404%	104.1
2-methyldecane	1.369%	37.5
5-methylundecane	0.216%	35.1
4-methylnonane	1.450%	40.2
3,5-dimethyloctane	0.153%	40.5
4,7-dimethylindan	0.013%	132.5
3,4-dimethylhexane	0.009%	45.3
3,4-dimethylheptane	0.567%	42.6
4,4-dimethylheptane	0.018%	37.2
3-methyloctane	0.567%	42.6
3-methylnonane	2.125%	40.2
3-methylhexane	0.009%	36.4
3-methylheptane	0.054%	45.0
4-methyldecane	2.575%	37.7
3-methylundecane	0.261%	35.1
3-methyldecane	1.540%	37.7
3-ethylhexane	0.009%	41.5
5-methyldecane	0.693%	37.7
3,6-dimethyloctane	0.423%	40.5
3-ethyltoluene	1.232%	101.9
3-ethyloctane	0.360%	44.4
3-ethylheptane	0.459%	43.1
4,5-dimethylnonane	0.333%	37.9
3-ethyl-2-methylhexane	0.036%	43.1
3-ethyl-2-methylheptane	2.080%	39.9
3,7-dimethylnonane	0.477%	37.9
4,6-dimethylindan	0.034%	132.5
4-methylheptane	0.027%	45.0
4-propylheptane	0.027%	40.5
6-ethyl-2-methyloctane	0.081%	38.0
3,3-dimethyloctane	0.486%	35.8
3,3-dimethylheptane	0.054%	37.2
2-methyloctane	0.630%	42.8
6-ethyl-2-methyldecane	0.027%	32.8
3,3,5-trimethylheptane	0.045%	36.2
2-methylnonane	1.837%	39.9
4-ethyltoluene	0.512%	90.6

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Decorative paint

3,3,4-trimethylhexane	0.009%	37.6
2-methylundecane	0.225%	35.2
4-ethyloctane	0.162%	44.4
4-ethyl-1,2-dimethylbenzene	0.296%	114.6
4-methyloctane	0.648%	42.3
C11 cycloalkanes	0.108%	38.4
C12 alkanes	0.477%	35.7
C11 alkanes	1.486%	36.4
C13 alkanes	0.009%	31.7
dimethylnonane	0.180%	38.4
C9 alkanes	0.090%	40.4
decalin	0.468%	44.4
butylbenzene	0.350%	69.0
ethylcyclohexane	0.486%	48.3
butylcyclohexane	1.351%	42.5
ethylbenzene	0.195%	73.0
C10 cycloalkanes	1.603%	38.4
6-methylundecane	0.171%	35.1
C12 cycloalkanes	0.045%	35.7
C11 aromatic hydrocarbons	0.013%	134.2
C10 alkanes	1.270%	38.7
cycloheptane	0.009%	53.4
benzyl alcohol	1.355%	46.9
C8 alkanes	0.009%	42.2
C9 cycloalkanes	0.090%	41.4
dodecane	0.513%	35.7
decane	8.454%	38.4
ethylisopropylbenzene	0.013%	105.7
dipentene	6.368%	74.5
pentylbenzene	0.013%	67.3
m-xylene	0.175%	110.8
tert-butylcyclopropane	0.009%	11.5
nonane	4.880%	41.4
indan	0.310%	79.7
pentylcyclohexane	0.333%	39.6
methylcyclohexane	0.081%	51.0
methylcyclodecane	0.072%	39.3
o-xylene	0.464%	105.3
tetramethylcyclohexane	0.261%	38.5

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Decorative paint

propylcyclopentane	0.009%	44.5
tri-n-butyl phosphate	1.355%	0.0
undecane	4.421%	38.4
isopropylbenzene	0.337%	50.0
propylcyclohexane	1.756%	45.4
toluene	0.054%	63.7
unspeciated	0.104%	51.3
hexylcyclohexane	0.009%	36.7
tert-pentylbenzene	0.135%	67.3
isopentylbenzene	0.054%	67.3
methyltetralin	0.020%	114.0
naphthalene	0.047%	97.7
octane	0.351%	45.3
p-xylene	0.162%	101.0
octahydroindan	0.243%	44.5
heptane	0.018%	49.4
propylbenzene	0.767%	63.6
unspeciated alkanes	0.108%	36.8
unspeciated hydrocarbons	0.450%	71.9
unspeciated cycloalkanes	0.054%	43.4
(1-methylpropyl)cyclohexane	1.477%	38.5
1,3-dimethyl-4-ethylbenzene	0.337%	114.6
1,4-dimethylcyclohexane	0.387%	48.2
1-methyl-1-phenylcyclopropane	0.074%	63.7
1-(2-butoxy-1-methyl-ethoxy)-2-propanol	1.355%	41.3
1,2,3,4-tetramethylbenzene	0.182%	114.6
1,2,3,4-tetrahydronaphthalene	0.141%	115.1
1-ethylpropylbenzene	0.101%	105.7
1,3-dimethyl-5-propylbenzene	0.040%	132.5
1,1,2-trimethylcyclohexane	0.333%	41.2
1,2-ethylmethylcyclopentane	0.027%	44.2
1,4-dimethyl-2-isopropylbenzene	0.054%	111.7
1,2,4-trimethylbenzene	2.423%	127.8
1,2,4-trimethylcyclohexane	0.216%	45.4
1-ethyl-4-methylcyclohexane	0.522%	45.6
1,2-propanediol	1.355%	44.6
1,2,4-trimethlycyclopentane	0.009%	43.6
1,2,3,5-tetramethylbenzene	0.229%	136.0
(2-methylbutyl)cyclohexane	0.108%	39.8

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Decorative paint

1-ethyl-2-propylbenzene	0.088%	86.2
1,1,3-trimethylcyclohexane	0.378%	41.2
1,2,3,5-tetramethylcyclohexane	0.369%	42.7
1-ethyl-2-propylcyclohexane	0.171%	40.0
1-methyl-1-propylcyclopentane	0.207%	37.9
1,2,4,4-tetramethylcyclopentane	0.063%	37.5
1,3,5-trimethylbenzene	1.171%	138.1
1-ethyl-3,5-dimethylbenzene	0.377%	136.0
1,1,4,4-tetramethylcyclohexane	0.234%	34.3
1,3-dimethylcyclohexane	0.153%	48.2
1,2,3-trimethylcyclopentane	0.018%	43.6
1,4-diethylbenzene	0.343%	89.6
1,1-dimethylcyclohexane	0.027%	42.8
1,2-dimethyl-3-isopropylcyclopentane	0.126%	39.3
1,2,3-trimethylcyclohexane	0.693%	45.4
1-ethyl-2,2,6-trimethylcyclohexane	0.414%	37.2
1,3-diethylbenzene	0.337%	104.1
1-ethyl-1,4-dimethylcyclohexane	0.162%	38.7
1,2-dimethylcyclohexane	0.171%	48.2
(1-methylethyl)cyclohexane	0.819%	40.5
1,3-ethylmethylcyclopentane	0.018%	44.2
1-ethyl-2,3-dimethylcyclohexane	0.189%	42.3
1,2,4,5-tetramethylbenzene	0.168%	114.6
(2-methylpropyl)cyclohexane	0.801%	42.7
1,2,3-trimethylbenzene	1.050%	126.7
1-ethyl-2,3-dimethylbenzene	0.276%	114.6
1-ethyl-3-methylcyclohexane	1.224%	45.6

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

45 Paint: OEM

Based on data provided by BCF - see naei99/rawdata/datafrmt/voc/species/paints_speciation_99.xls

Based on data provided by BCF - see naei99/rawdata/datafrmt/voc/species/paints_speciation_99.xls

Species	*% of total NMVOC*	*POCP*
2,3,3,4-tetramethylpentane	0.000%	37.2
2,3-dimethylnonane	0.016%	37.7
2-butoxyethanol	0.600%	48.3
2,3-dimethylheptane	0.022%	42.6
2,7-dimethyloctane	0.016%	39.9
2-butanone	5.167%	37.3
1-methyl-4-isopropylbenzene	0.065%	89.6
2-methylheptane	0.003%	44.6
2,2-dimethylpentane	0.011%	38.6
2-butoxyethyl acetate	0.600%	35.1
2,6-dimethylheptane	0.011%	42.3
2,6-dimethyloctane	0.082%	40.2
2,3-dimethyloctane	0.007%	40.2
2-methyldecane	0.065%	37.5
1-methyl-3-(isopropyl)benzene	0.019%	104.1
2-butanone oxime	0.400%	51.3
2,6-dimethyldecane	0.011%	35.1
1-methyl-2-isopropylbenzene	0.016%	88.4
1-methyl-4-tertbutylbenzene	0.011%	87.3
1-methyl-3-isopropylcyclopentane	0.000%	39.1
2,3-dimethylpentane	0.011%	39.1
2-methyl-5-ethyloctane	0.023%	38.0
2,5-dimethyloctane	0.027%	40.2
2,6-dimethylundecane	0.003%	31.7
2,3-dimethylundecane	0.004%	31.7
1-methyl-4-isopropylcyclohexane	0.068%	43.0
2,3,4-trimethylhexane	0.002%	42.9
2,4-dimethylheptane	0.003%	42.6
2-methyl-1-propanol	1.000%	36.0
2-methyl-1-butylbenzene	0.001%	86.2
1-methylindan	0.005%	80.0
2,5-dimethylhexane	0.000%	44.6
2-ethyl-1,3-dimethylbenzene	0.021%	114.6
2-(2-butoxyethoxy)ethanol	0.600%	50.2
2-methyldecalin	0.016%	41.4

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: OEM

2,3-dimethylbutane	0.010%	54.1
2,3,5-trimethylhexane	0.000%	42.6
2-methyl-2,4-pentanediol	0.400%	46.4
2,5-dimethyldecane	0.009%	34.6
1-methylbutylbenzene	0.011%	105.7
1-methyl-3-propylbenzene	0.038%	104.1
2,2,4-trimethyl-1,3-pentanediol monoisobutyrate	0.400%	27.5
2,4-dimethyl-1-(1-methylethyl)benzene	0.013%	111.7
2,4-dimethylpentane	0.011%	46.6
2,2,3,3-tetramethylhexane	0.026%	19.2
2,5-dimethylheptane	0.010%	51.2
1-methylindene	0.000%	136.2
1-methyl-2-propylbenzene	0.019%	88.4
2,2,5-trimethylhexane	0.002%	37.6
4-ethyltoluene	0.024%	90.6
3,4-dimethylhexane	0.000%	45.3
2-methylundecane	0.011%	35.2
3-ethyloctane	0.017%	44.4
3-ethyltoluene	0.059%	101.9
6-ethyl-2-methyldecane	0.001%	32.8
4,5-dimethylnonane	0.016%	37.9
3-ethyl-2-methylhexane	0.002%	43.1
2-propanol	1.000%	18.8
3-ethyl-2-methylheptane	0.099%	39.9
3,7-dimethylnonane	0.023%	37.9
4-ethyloctane	0.008%	44.4
3-ethylheptane	0.022%	43.1
4-methyldecane	0.122%	37.7
3-methylpentane	0.090%	47.9
2-methylhexane	0.080%	41.1
3-methyloctane	0.027%	42.6
4-methyl-2-pentanone	20.667%	49.0
3-methylnonane	0.101%	40.2
3-methylhexane	0.080%	36.4
2-methylnonane	0.087%	39.9
4-methyloctane	0.031%	42.3
4-propylheptane	0.001%	40.5
4,4-dimethylheptane	0.001%	37.2
3-methylundecane	0.012%	35.1

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: OEM

6-ethyl-2-methyloctane	0.004%	38.0
3-methyldecane	0.073%	37.7
2-methyloctane	0.030%	42.8
2-methylpentane	0.100%	42.0
5-methyldecane	0.033%	37.7
4-methylheptane	0.001%	45.0
3-methylheptane	0.003%	45.0
3-ethylhexane	0.000%	41.5
3,4-dimethylheptane	0.027%	42.6
4-ethyl-1,2-dimethylbenzene	0.014%	114.6
3,3-dimethylheptane	0.003%	37.2
5-methylundecane	0.010%	35.1
3,5-dimethyloctane	0.007%	40.5
3,3-dimethylpentane	0.011%	37.8
3,3,5-trimethylheptane	0.002%	36.2
4,7-dimethylindan	0.001%	132.5
3,6-dimethyloctane	0.020%	40.5
4-methylnonane	0.069%	40.2
3,3-dimethyloctane	0.023%	35.8
4-methyl-4-hydroxy-2-pentanone	1.000%	30.7
4,6-dimethylindan	0.002%	132.5
3,3,4-trimethylhexane	0.000%	37.6
ethylbenzene	2.779%	73.0
acetone	5.167%	9.4
dimethylcyclopentane	0.045%	45.8
C11 cycloalkanes	0.005%	38.4
C12 alkanes	0.023%	35.7
cyclohexane	0.095%	29.0
C8 alkanes	0.000%	42.2
C13 alkanes	0.000%	31.7
C11 aromatic hydrocarbons	0.001%	134.2
decalin	0.022%	44.4
butyl acetate	3.200%	26.9
C11 alkanes	0.071%	36.4
ethylisopropylbenzene	0.001%	105.7
butylbenzene	0.017%	69.0
dipentene	0.400%	74.5
ethanol	1.000%	39.9
C10 alkanes	0.060%	38.7

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: OEM

butylcyclohexane	0.064%	42.5
C10 cycloalkanes	0.076%	38.4
dodecane	0.024%	35.7
6-methylundecane	0.008%	35.1
ethyl acetate	0.800%	20.9
C9 alkanes	0.004%	40.4
ethyl hexanol	1.000%	53.5
dimethylnonane	0.009%	38.4
C9 cycloalkanes	0.004%	41.4
ethylcyclohexane	0.023%	48.3
cycloheptane	0.000%	53.4
C12 cycloalkanes	0.002%	35.7
ethyldimethylbenzene	4.431%	132.0
decane	0.402%	38.4
diethylbenzene	0.554%	105.7
tetramethylcyclohexane	0.012%	38.5
methanol	1.000%	14.0
pine oil	0.400%	74.5
m-xylene	7.624%	110.8
hexane	0.260%	48.2
isopentylbenzene	0.003%	67.3
p-xylene	1.808%	101.0
propylcyclopentane	0.000%	44.5
pentylcyclohexane	0.016%	39.6
toluene	3.464%	63.7
hexylcyclohexane	0.000%	36.7
methyltetralin	0.001%	114.0
methylindane	0.554%	80.0
octahydroindan	0.012%	44.5
isopropylbenzene	0.016%	50.0
heptane	0.096%	49.4
naphthalene	0.695%	97.7
o-xylene	1.684%	105.3
indan	0.292%	79.7
tert-butylcyclopropane	0.000%	11.5
nonane	0.232%	41.4
octane	0.017%	45.3
methylcyclopentane	0.065%	48.1
propylbenzene	0.590%	63.6

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: OEM

methylpropylbenzene	1.800%	105.7
methylcyclohexane	0.039%	51.0
methylcyclodecane	0.003%	39.3
unspeciated	0.005%	51.3
pentylbenzene	0.001%	67.3
tert-pentylbenzene	0.006%	67.3
propylcyclohexane	0.083%	45.4
undecane	0.210%	38.4
methylethylbenzene	4.708%	94.1
unspeciated cycloalkanes	0.003%	43.4
unspeciated alkanes	0.005%	36.8
unspeciated aromatic hydrocarbons	1.800%	95.4
unspeciated hydrocarbons	0.021%	71.9
1-methyl-1-propylcyclopentane	0.010%	37.9
1,2,4-trimethylbenzene	5.931%	127.8
1,2,3,4-tetramethylbenzene	0.655%	114.6
1,4-dimethylcyclohexane	0.018%	48.2
1,2-ethylmethylcyclopentane	0.001%	44.2
1-ethyl-2,2,6-trimethylcyclohexane	0.020%	37.2
1-butanol	4.000%	62.0
1,1-dimethylcyclohexane	0.001%	42.8
1-ethyl-2-propylbenzene	0.004%	86.2
1,3-dimethyl-5-propylbenzene	0.002%	132.5
(2-methylpropyl)cyclohexane	0.038%	42.7
1-methoxy-2-propyl acetate	0.600%	32.3
1,2,3-trimethylcyclopentane	0.001%	43.6
1-methyl-1-phenylcyclopropane	0.004%	63.7
1-ethylpropylbenzene	0.005%	105.7
1,3-ethylmethylcyclopentane	0.001%	44.2
1,2,3,4-tetrahydronaphthalene	0.007%	115.1
1,1,3-trimethylcyclohexane	0.018%	41.2
1-ethyl-2-propylcyclohexane	0.008%	40.0
1-ethyl-2,3-dimethylbenzene	0.013%	114.6
1,2-dimethyl-3-isopropylcyclopentane	0.006%	39.3
1,2,3,5-tetramethylbenzene	1.626%	136.0
1,2-dimethylcyclohexane	0.008%	48.2
1-ethyl-1,4-dimethylcyclohexane	0.008%	38.7
1,2,4,4-tetramethylcyclopentane	0.003%	37.5
1-methoxy-2-propanol	0.600%	35.5

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: OEM

1,2,3-trimethylbenzene	1.850%	126.7
1,4-diethylbenzene	0.016%	89.6
1,4-dimethyl-2-isopropylbenzene	0.003%	111.7
1,3,5-trimethylbenzene	1.440%	138.1
1,2,4,5-tetramethylbenzene	1.070%	114.6
(1-methylpropyl)cyclohexane	0.070%	38.5
1-ethyl-2,3-dimethylcyclohexane	0.009%	42.3
1,3-dimethyl-4-ethylbenzene	0.016%	114.6
1-ethyl-3-methylcyclohexane	0.058%	45.6
1,2,3-trimethylcyclohexane	0.033%	45.4
1,2,3,5-tetramethylcyclohexane	0.018%	42.7
(2-methylbutyl)cyclohexane	0.005%	39.8
(1-methylethyl)cyclohexane	0.039%	40.5
1-ethyl-4-methylcyclohexane	0.025%	45.6
1-ethyl-3,5-dimethylbenzene	0.018%	136.0
1,3-diethylbenzene	0.016%	104.1
1,3-dimethylcyclohexane	0.007%	48.2
1,1,2-trimethylcyclohexane	0.016%	41.2
1,2,4-trimethylcyclohexane	0.010%	45.4
1,1,4,4-tetramethylcyclohexane	0.011%	34.3
1,2,4-trimethlycyclopentane	0.000%	43.6

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

46 Paint: vehicle refinishing

Based on data provided by BCF - see naei99/rawdata/datafrmt/voc/species/paints_speciation_99.xls

Based on data provided by BCF - see naei99/rawdata/datafrmt/voc/species/paints_speciation_99.xls

Species	*% of total NMVOC*	*POCP*
2,6-dimethylheptane	0.030%	42.3
2,2-dimethylpentane	0.123%	38.6
1-methylindan	0.013%	80.0
1-methyl-4-isopropylcyclohexane	0.184%	43.0
2,3-dimethyloctane	0.019%	40.2
2,2,5-trimethylhexane	0.005%	37.6
2,4-dimethylheptane	0.009%	42.6
2,4-dimethylpentane	0.123%	46.6
2-methyldecalin	0.043%	41.4
2,5-dimethyloctane	0.075%	40.2
2,5-dimethylhexane	0.001%	44.6
2,4-dimethyl-1-(1-methylethyl)benzene	0.035%	111.7
2,3,5-trimethylhexane	0.001%	42.6
2,5-dimethylheptane	0.028%	51.2
2,3-dimethylheptane	0.060%	42.6
2,2,3,3-tetramethylhexane	0.070%	19.2
2,3-dimethylbutane	0.109%	54.1
2,6-dimethyldecane	0.029%	35.1
2,3,4-trimethylhexane	0.005%	42.9
2,3-dimethylpentane	0.123%	39.1
1-methyl-4-tertbutylbenzene	0.030%	87.3
2-methyldecane	0.177%	37.5
2,3-dimethylundecane	0.011%	31.7
1-methylbutylbenzene	0.029%	105.7
2,5-dimethyldecane	0.023%	34.6
2,3,3,4-tetramethylpentane	0.001%	37.2
2-methyl-5-ethyloctane	0.062%	38.0
1-methylindene	0.001%	136.2
2,3-dimethylnonane	0.044%	37.7
2-ethyl-1,3-dimethylbenzene	0.057%	114.6
2-butoxyethanol	1.000%	48.3
2-butoxyethyl acetate	0.250%	35.1
1-methyl-3-propylbenzene	0.104%	104.1
1-methyl-3-(isopropyl)benzene	0.052%	104.1
2-methyl-1-butylbenzene	0.003%	86.2

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: vehicle refinishing

2-ethoxyethanol	0.250%	38.6
2,6-dimethylundecane	0.007%	31.7
2-methyl-2,4-pentanediol	0.545%	46.4
2-butanone oxime	0.545%	51.3
2-methylheptane	0.009%	44.6
1-methyl-3-isopropylcyclopentane	0.001%	39.1
2-methyl-1-propanol	2.000%	36.0
2,7-dimethyloctane	0.044%	39.9
1-methyl-4-isopropylbenzene	0.178%	89.6
1-methyl-2-propylbenzene	0.052%	88.4
2-butanone	4.449%	37.3
1-methyl-2-isopropylbenzene	0.045%	88.4
2-butanol	0.500%	44.7
2,6-dimethyloctane	0.223%	40.2
3-ethyltoluene	0.160%	101.9
3,4-dimethylheptane	0.074%	42.6
3-methyldecane	0.200%	37.7
4,7-dimethylindan	0.002%	132.5
2-propyl acetate	0.278%	21.1
2-methylpentane	1.091%	42.0
4-methylheptane	0.004%	45.0
4-methyloctane	0.084%	42.3
3,3-dimethylheptane	0.007%	37.2
2-methylnonane	0.238%	39.9
5-methyldecane	0.090%	37.7
2-methyloctane	0.082%	42.8
3-methylhexane	0.874%	36.4
2-methylhexane	0.873%	41.1
4-methyldecane	0.334%	37.7
3-methyloctane	0.074%	42.6
4-methyl-4-hydroxy-2-pentanone	0.500%	30.7
4-methyl-2-pentanone	3.580%	49.0
3,3-dimethyloctane	0.063%	35.8
6-ethyl-2-methyloctane	0.011%	38.0
5-methylundecane	0.028%	35.1
4-ethyl-1,2-dimethylbenzene	0.038%	114.6
3,3-dimethylpentane	0.123%	37.8
4-methyl-2-pentanol	0.500%	60.9
3-methylheptane	0.007%	45.0

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: vehicle refinishing

3-pentanone	0.834%	41.4
4-propylheptane	0.004%	40.5
3-methylundecane	0.034%	35.1
3-methylnonane	0.275%	40.2
4-ethyloctane	0.021%	44.4
4,5-dimethylnonane	0.043%	37.9
3,5-dimethyloctane	0.020%	40.5
3,3,4-trimethylhexane	0.001%	37.6
2-propanol	2.000%	18.8
4-methylnonane	0.188%	40.2
2-methylundecane	0.029%	35.2
3-ethylheptane	0.060%	43.1
3,3,5-trimethylheptane	0.006%	36.2
3-ethyl-2-methylheptane	0.270%	39.9
3-ethylhexane	0.001%	41.5
6-ethyl-2-methyldecane	0.004%	32.8
3,7-dimethylnonane	0.062%	37.9
4-ethyltoluene	0.066%	90.6
3-methylpentane	0.982%	47.9
3,6-dimethyloctane	0.055%	40.5
4,4-dimethylheptane	0.002%	37.2
3-ethyl-2-methylhexane	0.005%	43.1
3-ethyloctane	0.047%	44.4
4,6-dimethylindan	0.004%	132.5
3,4-dimethylhexane	0.001%	45.3
butyl acetate	5.000%	26.9
decane	1.096%	38.4
diethylbenzene	0.088%	105.7
dichloromethane	0.636%	6.8
acetone	4.171%	9.4
butyl glycolate	1.250%	26.8
C10 alkanes	0.165%	38.7
C9 alkanes	0.012%	40.4
butoxyl	1.250%	51.3
6-methylundecane	0.022%	35.1
butylcyclohexane	0.175%	42.5
C9 cycloalkanes	0.012%	41.4
cycloheptane	0.001%	53.4
C12 cycloalkanes	0.006%	35.7

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: vehicle refinishing

ethyldimethylbenzene	0.308%	132.0
ethanol	0.500%	39.9
cyclohexanone	0.869%	29.9
C12 alkanes	0.062%	35.7
C8 alkanes	0.001%	42.2
C11 alkanes	0.193%	36.4
ethylisopropylbenzene	0.002%	105.7
ethylbenzene	3.545%	73.0
C11 cycloalkanes	0.014%	38.4
cyclohexane	1.036%	29.0
C13 alkanes	0.001%	31.7
C11 aromatic hydrocarbons	0.002%	134.2
ethylcyclohexane	0.063%	48.3
ethyl acetate	1.667%	20.9
dipentene	0.545%	74.5
butylbenzene	0.045%	69.0
decalin	0.061%	44.4
C10 cycloalkanes	0.208%	38.4
dimethylcyclopentane	0.491%	45.8
dimethylnonane	0.023%	38.4
butyl lactate	1.250%	29.1
dodecane	0.067%	35.7
pentylbenzene	0.002%	67.3
methylcyclodecane	0.009%	39.3
pentylcyclohexane	0.043%	39.6
naphthalene	0.006%	97.7
tetramethylcyclohexane	0.034%	38.5
nonane	0.633%	41.4
o-xylene	2.172%	105.3
heptane	1.039%	49.4
methylcyclohexane	0.392%	51.0
methyltetralin	0.003%	114.0
octane	0.046%	45.3
toluene	17.603%	63.7
methylpropylbenzene	0.176%	105.7
methylethylbenzene	1.320%	94.1
methylcyclopentane	0.709%	48.1
undecane	0.573%	38.4
p-xylene	2.308%	101.0

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: vehicle refinishing

octahydroindan	0.032%	44.5
propyl acetate	0.174%	28.2
propylcyclohexane	0.228%	45.4
unspeciated	0.013%	51.3
isopentylbenzene	0.007%	67.3
propylcyclopentane	0.001%	44.5
propylbenzene	0.275%	63.6
indan	0.040%	79.7
m-xylene	9.700%	110.8
tert-butylcyclopropane	0.001%	11.5
isopropylbenzene	0.044%	50.0
tert-pentylbenzene	0.017%	67.3
hexylcyclohexane	0.001%	36.7
hexane	2.836%	48.2
unspeciated cycloalkanes	0.007%	43.4
unspeciated aromatic hydrocarbons	0.220%	95.4
unspeciated alkanes	0.014%	36.8
unspeciated hydrocarbons	0.058%	71.9
1,4-dimethylcyclohexane	0.050%	48.2
1,2,3,4-tetrahydronaphthalene	0.018%	115.1
(1-methylethyl)cyclohexane	0.106%	40.5
1,2,4-trimethylcyclohexane	0.028%	45.4
1,3-ethylmethylcyclopentane	0.002%	44.2
1,1-dimethylcyclohexane	0.004%	42.8
1,3-dimethylcyclohexane	0.020%	48.2
1,4-dimethyl-2-isopropylbenzene	0.007%	111.7
1,1,4,4-tetramethylcyclohexane	0.030%	34.3
1-methoxy-2-propanol	0.250%	35.5
1-methoxy-2-propyl acetate	1.000%	32.3
1,4-diethylbenzene	0.045%	89.6
1,2-dimethyl-3-isopropylcyclopentane	0.016%	39.3
1,2-dimethylcyclohexane	0.022%	48.2
(2-methylbutyl)cyclohexane	0.014%	39.8
1-ethyl-2,3-dimethylbenzene	0.036%	114.6
1,2-propanediol	0.545%	44.6
1-ethoxy-2-propyl acetate	0.250%	35.2
1,2,3-trimethylcyclopentane	0.002%	43.6
1,3,5-trimethylbenzene	0.504%	138.1
1,1,2-trimethylcyclohexane	0.043%	41.2

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: vehicle refinishing

(1-methylpropyl)cyclohexane	0.191%	38.5
1,2,3,5-tetramethylbenzene	0.059%	136.0
1-ethyl-4-methylcyclohexane	0.068%	45.6
1-methyl-1-propylcyclopentane	0.027%	37.9
1,2,4-trimethlycyclopentane	0.001%	43.6
1-ethyl-2,2,6-trimethylcyclohexane	0.054%	37.2
1,2,4,5-tetramethylbenzene	0.051%	114.6
1,2,4,4-tetramethylcyclopentane	0.008%	37.5
1-ethyl-3-methylcyclohexane	0.159%	45.6
1,3-diethylbenzene	0.044%	104.1
1,2-ethylmethylcyclopentane	0.004%	44.2
1,2,3,5-tetramethylcyclohexane	0.048%	42.7
1-ethyl-3,5-dimethylbenzene	0.049%	136.0
1-ethyl-1,4-dimethylcyclohexane	0.021%	38.7
1,3-dimethyl-4-ethylbenzene	0.044%	114.6
1,2,3-trimethylcyclohexane	0.090%	45.4
1-ethyl-2-propylbenzene	0.011%	86.2
1,3-dimethyl-5-propylbenzene	0.005%	132.5
1-ethylpropylbenzene	0.013%	105.7
1,2,3-trimethylbenzene	0.444%	126.7
1,2,4-trimethylbenzene	1.678%	127.8
1-ethyl-2,3-dimethylcyclohexane	0.025%	42.3
1,2,3,4-tetramethylbenzene	0.053%	114.6
1-methyl-1-phenylcyclopropane	0.010%	63.7
1-butanol	2.000%	62.0
(2-methylpropyl)cyclohexane	0.104%	42.7
1,1,3-trimethylcyclohexane	0.049%	41.2
1-ethyl-2-propylcyclohexane	0.022%	40.0

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

47 Paint: wood coating

Based on data provided by BCF - see naei99/rawdata/datafrmt/voc/species/paints_speciation_99.xls

Based on data provided by BCF - see naei99/rawdata/datafrmt/voc/species/paints_speciation_99.xls

Species	*% of total NMVOC*	*POCP*
2,3-dimethylundecane	0.001%	31.7
2,5-dimethylhexane	0.000%	44.6
1-methyl-3-(isopropyl)benzene	0.003%	104.1
1-methyl-4-tertbutylbenzene	0.002%	87.3
2-methyl-5-ethyloctane	0.003%	38.0
2,3-dimethylnonane	0.002%	37.7
2,4-dimethyl-1-(1-methylethyl)benzene	0.002%	111.7
2-butoxyethanol	0.500%	48.3
2-butanone	6.000%	37.3
1-methyl-3-isopropylcyclopentane	0.000%	39.1
2-methyldecane	0.010%	37.5
1-methyl-4-isopropylbenzene	0.010%	89.6
2-methylheptane	0.001%	44.6
2,7-dimethyloctane	0.002%	39.9
2,6-dimethylundecane	0.000%	31.7
2,3-dimethylheptane	0.003%	42.6
2,3-dimethylpentane	0.027%	39.1
1-methylindene	0.000%	136.2
2-methyl-1-propanol	4.889%	36.0
2,5-dimethyloctane	0.004%	40.2
2,4-dimethylheptane	0.001%	42.6
2,6-dimethylheptane	0.002%	42.3
2,6-dimethyloctane	0.012%	40.2
2,2-dimethylpentane	0.027%	38.6
1-methyl-2-isopropylbenzene	0.002%	88.4
2,5-dimethylheptane	0.002%	51.2
2,3,3,4-tetramethylpentane	0.000%	37.2
1-methyl-4-isopropylcyclohexane	0.010%	43.0
1-methyl-2-propylbenzene	0.003%	88.4
2,3,4-trimethylhexane	0.000%	42.9
1-methylbutylbenzene	0.002%	105.7
2,2,5-trimethylhexane	0.000%	37.6
2-ethyl-1,3-dimethylbenzene	0.003%	114.6
2-methyldecalin	0.002%	41.4
2,6-dimethyldecane	0.002%	35.1

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: wood coating

2,5-dimethyldecane	0.001%	34.6
2-methyl-1-butylbenzene	0.000%	86.2
2-butanol	1.222%	44.7
1-methylindan	0.001%	80.0
2,3-dimethyloctane	0.001%	40.2
2,2,3,3-tetramethylhexane	0.004%	19.2
2,4-dimethylpentane	0.027%	46.6
2,3,5-trimethylhexane	0.000%	42.6
2,3-dimethylbutane	0.024%	54.1
2-ethoxyethanol	0.500%	38.6
1-methyl-3-propylbenzene	0.006%	104.1
3,6-dimethyloctane	0.003%	40.5
3,5-dimethyloctane	0.001%	40.5
2-propyl acetate	1.900%	21.1
3-methylhexane	0.192%	36.4
3-ethyl-2-methylheptane	0.015%	39.9
2-propanol	4.889%	18.8
2-methylhexane	0.192%	41.1
3,3-dimethyloctane	0.003%	35.8
3-methylnonane	0.015%	40.2
3-ethyl-2-methylhexane	0.000%	43.1
4-methyldecane	0.018%	37.7
3-methyloctane	0.004%	42.6
3,7-dimethylnonane	0.003%	37.9
5-methylundecane	0.002%	35.1
3-methyldecane	0.011%	37.7
3-ethyltoluene	0.009%	101.9
6-ethyl-2-methyldecane	0.000%	32.8
3,3,5-trimethylheptane	0.000%	36.2
4-methylheptane	0.000%	45.0
3-ethyloctane	0.003%	44.4
4-methyloctane	0.005%	42.3
2-methylpentane	0.240%	42.0
2-methyloctane	0.004%	42.8
3-ethylhexane	0.000%	41.5
2-methylnonane	0.013%	39.9
3,4-dimethylheptane	0.004%	42.6
5-methyl-2-hexanone	1.500%	51.6
3,4-dimethylhexane	0.000%	45.3

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: wood coating

3-ethylheptane	0.003%	43.1
3,3,4-trimethylhexane	0.000%	37.6
2-methylundecane	0.002%	35.2
6-ethyl-2-methyloctane	0.001%	38.0
4-methylnonane	0.010%	40.2
5-methyldecane	0.005%	37.7
3,3-dimethylpentane	0.027%	37.8
3-methylheptane	0.000%	45.0
3,3-dimethylheptane	0.000%	37.2
4,6-dimethylindan	0.000%	132.5
4-methyl-4-hydroxy-2-pentanone	1.222%	30.7
4-ethyl-1,2-dimethylbenzene	0.002%	114.6
4,7-dimethylindan	0.000%	132.5
3-methylpentane	0.216%	47.9
4-ethyltoluene	0.004%	90.6
3-methylundecane	0.002%	35.1
4-propylheptane	0.000%	40.5
4,4-dimethylheptane	0.000%	37.2
4-methyl-2-pentanone	6.000%	49.0
4-ethyloctane	0.001%	44.4
4,5-dimethylnonane	0.002%	37.9
C12 alkanes	0.003%	35.7
dimethylcyclopentane	0.108%	45.8
ethanol	4.889%	39.9
dodecane	0.004%	35.7
ethyl acetate	7.600%	20.9
C11 cycloalkanes	0.001%	38.4
C9 cycloalkanes	0.001%	41.4
cyclohexanone	1.500%	29.9
C13 alkanes	0.000%	31.7
butylcyclohexane	0.010%	42.5
ethylbenzene	2.935%	73.0
dimethylnonane	0.001%	38.4
C11 alkanes	0.011%	36.4
butylbenzene	0.002%	69.0
decane	0.060%	38.4
diethylbenzene	0.073%	105.7
C12 cycloalkanes	0.000%	35.7
acetone	6.000%	9.4

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: wood coating

6-methylundecane	0.001%	35.1
cycloheptane	0.000%	53.4
C10 cycloalkanes	0.011%	38.4
decalin	0.003%	44.4
cyclohexane	0.228%	29.0
ethylcyclohexane	0.003%	48.3
ethylisopropylbenzene	0.000%	105.7
butyl acetate	7.600%	26.9
C9 alkanes	0.001%	40.4
C8 alkanes	0.000%	42.2
C10 alkanes	0.009%	38.7
C11 aromatic hydrocarbons	0.000%	134.2
ethyldimethylbenzene	0.257%	132.0
unspeciated	0.001%	51.3
m-xylene	8.068%	110.8
octane	0.003%	45.3
methyltetralin	0.000%	114.0
methylcyclopentane	0.156%	48.1
toluene	14.667%	63.7
isopropylbenzene	0.002%	50.0
propylcyclohexane	0.013%	45.4
propylcyclopentane	0.000%	44.5
propylbenzene	0.152%	63.6
tetramethylcyclohexane	0.002%	38.5
methylethylbenzene	1.100%	94.1
methylcyclodecane	0.001%	39.3
pentylcyclohexane	0.002%	39.6
naphthalene	0.000%	97.7
methylcyclohexane	0.085%	51.0
indan	0.002%	79.7
hexane	0.624%	48.2
nonane	0.035%	41.4
tert-pentylbenzene	0.001%	67.3
p-xylene	1.908%	101.0
tert-butylcyclopropane	0.000%	11.5
undecane	0.032%	38.4
o-xylene	1.763%	105.3
heptane	0.228%	49.4
pentylbenzene	0.000%	67.3

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: wood coating

hexylcyclohexane	0.000%	36.7
isopentylbenzene	0.000%	67.3
methylpropylbenzene	0.147%	105.7
octahydroindan	0.002%	44.5
unspeciated cycloalkanes	0.000%	43.4
unspeciated alkanes	0.001%	36.8
unspeciated aromatic hydrocarbons	0.183%	95.4
unspeciated hydrocarbons	0.003%	71.9
1-ethyl-2,3-dimethylcyclohexane	0.001%	42.3
1-ethyl-3,5-dimethylbenzene	0.003%	136.0
1-ethyl-2-propylbenzene	0.001%	86.2
1-ethyl-2,3-dimethylbenzene	0.002%	114.6
1,3-diethylbenzene	0.002%	104.1
1,1-dimethylcyclohexane	0.000%	42.8
1,2,3-trimethylbenzene	0.264%	126.7
1,3-ethylmethylcyclopentane	0.000%	44.2
1-ethyl-2,2,6-trimethylcyclohexane	0.003%	37.2
1,2,4,4-tetramethylcyclopentane	0.000%	37.5
1-ethyl-2-propylcyclohexane	0.001%	40.0
1,2,3-trimethylcyclopentane	0.000%	43.6
1,3-dimethylcyclohexane	0.001%	48.2
1,2-dimethylcyclohexane	0.001%	48.2
1-methyl-1-propylcyclopentane	0.001%	37.9
1,2-dimethyl-3-isopropylcyclopentane	0.001%	39.3
1,2,3-trimethylcyclohexane	0.005%	45.4
(2-methylbutyl)cyclohexane	0.001%	39.8
1,3,5-trimethylbenzene	0.302%	138.1
1,4-dimethyl-2-isopropylbenzene	0.000%	111.7
1-butanol	4.889%	62.0
1-methyl-1-phenylcyclopropane	0.001%	63.7
1,2-ethylmethylcyclopentane	0.000%	44.2
1,2,3,4-tetramethylbenzene	0.026%	114.6
1,2,4-trimethylcyclohexane	0.002%	45.4
1-ethyl-4-methylcyclohexane	0.004%	45.6
1,1,4,4-tetramethylcyclohexane	0.002%	34.3
1-ethoxy-2-propyl acetate	0.500%	35.2
1,4-dimethylcyclohexane	0.003%	48.2
1,4-diethylbenzene	0.002%	89.6
1,2,4-trimethylbenzene	1.154%	127.8

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: wood coating

(2-methylpropyl)cyclohexane	0.006%	42.7
(1-methylethyl)cyclohexane	0.006%	40.5
1,3-dimethyl-4-ethylbenzene	0.002%	114.6
1,2,3,4-tetrahydronaphthalene	0.001%	115.1
(1-methylpropyl)cyclohexane	0.011%	38.5
1,2,3,5-tetramethylbenzene	0.026%	136.0
1,2,4,5-tetramethylbenzene	0.026%	114.6
1-ethylpropylbenzene	0.001%	105.7
1,1,3-trimethylcyclohexane	0.003%	41.2
1,3-dimethyl-5-propylbenzene	0.000%	132.5
1-ethyl-3-methylcyclohexane	0.009%	45.6
1-ethoxy-2-propanol	0.500%	49.7
1,1,2-trimethylcyclohexane	0.002%	41.2
1,2,4-trimethlycyclopentane	0.000%	43.6
1,2,3,5-tetramethylcyclohexane	0.003%	42.7
1-ethyl-1,4-dimethylcyclohexane	0.001%	38.7
(2-methyl-1-propyl)acetate	1.900%	32.8

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

48 Paint: coil coating

Based on data provided by BCF - see naei99/rawdata/datafrmt/voc/species/paints_speciation_99.xls

Based on data provided by BCF - see naei99/rawdata/datafrmt/voc/species/paints_speciation_99.xls

Species	*% of total NMVOC*	*POCP*
2,4-dimethylheptane	0.010%	42.6
1-methylbutylbenzene	0.032%	105.7
2-methyl-1-propanol	1.667%	36.0
2-(2-ethoxyethoxy)ethanol	2.400%	49.3
1-methyl-3-propylbenzene	0.114%	104.1
2,5-dimethyldecane	0.026%	34.6
1-methylindan	0.014%	80.0
2-(2-ethoxyethoxy)ethyl acetate	2.400%	34.6
2-(2-butoxyethoxy)ethyl acetate	2.400%	40.0
2-(2-butoxyethoxy)ethanol	2.400%	50.2
2-butoxyethyl acetate	2.400%	35.1
1-methyl-2-isopropylbenzene	0.049%	88.4
2,3,3,4-tetramethylpentane	0.001%	37.2
2,3,4-trimethylhexane	0.005%	42.9
2,2,5-trimethylhexane	0.005%	37.6
2-ethyl-1,3-dimethylbenzene	0.062%	114.6
2-methyldecalin	0.048%	41.4
1-methyl-2-propylbenzene	0.058%	88.4
2,3,5-trimethylhexane	0.001%	42.6
2-ethoxyethyl acetate	9.600%	34.6
2-ethoxyethanol	2.400%	38.6
2,3-dimethyloctane	0.021%	40.2
2,2,3,3-tetramethylhexane	0.077%	19.2
2-butanol	1.667%	44.7
2,3-dimethylheptane	0.065%	42.6
2-butoxyethanol	2.400%	48.3
2,3-dimethylnonane	0.049%	37.7
1-methyl-3-(isopropyl)benzene	0.058%	104.1
2-methylheptane	0.010%	44.6
2,5-dimethylheptane	0.031%	51.2
1-methylindene	0.001%	136.2
1-methyl-3-isopropylcyclopentane	0.001%	39.1
2,3-dimethylundecane	0.012%	31.7
2-methyldecane	0.195%	37.5
2,4-dimethyl-1-(1-methylethyl)benzene	0.038%	111.7

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: coil coating

2-methyl-1-butylbenzene	0.004%	86.2
2,6-dimethylheptane	0.033%	42.3
2-methyl-5-ethyloctane	0.068%	38.0
2,6-dimethyldecane	0.032%	35.1
1-methyl-4-isopropylbenzene	0.196%	89.6
2,7-dimethyloctane	0.049%	39.9
2,6-dimethylundecane	0.008%	31.7
1-methyl-4-tertbutylbenzene	0.033%	87.3
2,6-dimethyloctane	0.245%	40.2
1-methyl-4-isopropylcyclohexane	0.203%	43.0
2,5-dimethylhexane	0.001%	44.6
2,5-dimethyloctane	0.082%	40.2
4,4-dimethylheptane	0.003%	37.2
3,3,5-trimethylheptane	0.006%	36.2
3,3,4-trimethylhexane	0.001%	37.6
5-methylundecane	0.031%	35.1
4-methylnonane	0.207%	40.2
3,3-dimethylheptane	0.008%	37.2
4-methylheptane	0.004%	45.0
4-propylheptane	0.004%	40.5
3,3-dimethyloctane	0.069%	35.8
4-ethyl-1,2-dimethylbenzene	0.042%	114.6
3,5-dimethyloctane	0.022%	40.5
4,5-dimethylnonane	0.048%	37.9
3-ethylheptane	0.065%	43.1
3-ethyl-2-methylheptane	0.297%	39.9
3-methylhexane	0.001%	36.4
3,7-dimethylnonane	0.068%	37.9
3-ethylhexane	0.001%	41.5
4,7-dimethylindan	0.002%	132.5
4,6-dimethylindan	0.005%	132.5
4-methyl-4-hydroxy-2-pentanone	1.667%	30.7
3,4-dimethylhexane	0.001%	45.3
3-ethyloctane	0.051%	44.4
3-ethyl-2-methylhexane	0.005%	43.1
3-methylnonane	0.303%	40.2
3,4-dimethylheptane	0.081%	42.6
4-ethyloctane	0.023%	44.4
3,6-dimethyloctane	0.060%	40.5

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: coil coating

6-ethyl-2-methyloctane	0.012%	38.0
2-methylnonane	0.262%	39.9
3-methylheptane	0.008%	45.0
3-methyldecane	0.220%	37.7
5-methyldecane	0.099%	37.7
4-methyldecane	0.367%	37.7
6-ethyl-2-methyldecane	0.004%	32.8
4-ethyltoluene	0.073%	90.6
3-methyloctane	0.081%	42.6
2-methylundecane	0.032%	35.2
4-methyl-1,3-dioxol-2-one	0.167%	21.9
4-methyloctane	0.092%	42.3
2-methyloctane	0.090%	42.8
3-ethyltoluene	0.176%	101.9
2-propanol	1.667%	18.8
3-methylundecane	0.037%	35.1
butylcyclohexane	0.193%	42.5
C9 cycloalkanes	0.013%	41.4
cycloheptane	0.001%	53.4
decane	1.206%	38.4
decalin	0.067%	44.4
cyclohexanone	0.600%	29.9
butyrolactone	0.167%	51.3
butylbenzene	0.050%	69.0
C10 alkanes	0.181%	38.7
C12 cycloalkanes	0.006%	35.7
ethylisopropylbenzene	0.002%	105.7
dimethyl esters	3.000%	17.1
C11 aromatic hydrocarbons	0.002%	134.2
ethylcyclohexane	0.069%	48.3
C12 alkanes	0.068%	35.7
dimethylnonane	0.026%	38.4
dodecane	0.073%	35.7
diethylbenzene	0.467%	105.7
C9 alkanes	0.013%	40.4
ethyldimethylbenzene	3.733%	132.0
C13 alkanes	0.001%	31.7
C10 cycloalkanes	0.229%	38.4
bis(2-hydroxyethyl)ether	0.167%	40.2

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: coil coating

6-methylundecane	0.024%	35.1
C8 alkanes	0.001%	42.2
ethylbenzene	2.361%	73.0
C11 cycloalkanes	0.015%	38.4
ethanol	1.667%	39.9
C11 alkanes	0.212%	36.4
dimethylformamide	0.167%	51.3
methylethylbenzene	3.967%	94.1
propylbenzene	0.576%	63.6
methylcyclohexane	0.012%	51.0
undecane	0.630%	38.4
unspeciated	0.015%	51.3
propylcyclohexane	0.250%	45.4
methyltetralin	0.003%	114.0
hexylcyclohexane	0.001%	36.7
nonane	0.696%	41.4
tert-butylcyclopropane	0.001%	11.5
indan	0.277%	79.7
o-xylene	1.466%	105.3
naphthalene	0.590%	97.7
N-methyl pyrrolidone	0.167%	51.3
heptane	0.003%	49.4
propylcyclopentane	0.001%	44.5
octahydroindan	0.035%	44.5
p-xylene	1.540%	101.0
octane	0.050%	45.3
isophorone	2.400%	77.6
toluene	0.008%	63.7
methylpropylbenzene	1.517%	105.7
tert-pentylbenzene	0.019%	67.3
methylindane	0.467%	80.0
tetramethylcyclohexane	0.037%	38.5
isopropylbenzene	0.048%	50.0
isopentylbenzene	0.008%	67.3
m-xylene	6.442%	110.8
phenol	0.167%	63.3
pentylbenzene	0.002%	67.3
pentylcyclohexane	0.048%	39.6
methylcyclodecane	0.010%	39.3

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: coil coating

unspeciated hydrocarbons	0.064%	71.9
unspeciated alkanes	0.015%	36.8
unspeciated aromatic hydrocarbons	1.517%	95.4
unspeciated cycloalkanes	0.008%	43.4
1,3-dimethyl-5-propylbenzene	0.006%	132.5
1-methyl-1-phenylcyclopropane	0.011%	63.7
1-methyl-1-propylcyclopentane	0.030%	37.9
1,3,5-trimethylbenzene	1.334%	138.1
1,2-ethylmethylcyclopentane	0.004%	44.2
1,2-dimethylcyclohexane	0.024%	48.2
1,3-dimethylcyclohexane	0.022%	48.2
(2-methylbutyl)cyclohexane	0.015%	39.8
1,1,3-trimethylcyclohexane	0.054%	41.2
1,1,4,4-tetramethylcyclohexane	0.033%	34.3
1,3-diethylbenzene	0.048%	104.1
1,3-dimethyl-4-ethylbenzene	0.048%	114.6
1,2,3,4-tetrahydronaphthalene	0.020%	115.1
1-ethyl-1,4-dimethylcyclohexane	0.023%	38.7
1,2,4-trimethylcyclohexane	0.031%	45.4
(1-methylethyl)cyclohexane	0.117%	40.5
1,4-dimethylcyclohexane	0.055%	48.2
1-ethyl-4-methylcyclohexane	0.074%	45.6
1,2,3-trimethylcyclopentane	0.003%	43.6
1,2,4-trimethlycyclopentane	0.001%	43.6
1-ethyl-2,3-dimethylbenzene	0.039%	114.6
1-ethoxy-2-propyl acetate	2.400%	35.2
1-ethyl-3-methylcyclohexane	0.175%	45.6
1-ethyl-2,2,6-trimethylcyclohexane	0.059%	37.2
1,2,3,5-tetramethylcyclohexane	0.053%	42.7
1-ethylpropylbenzene	0.014%	105.7
1,2,4,4-tetramethylcyclopentane	0.009%	37.5
1,2,4-trimethylbenzene	5.246%	127.8
1,2,3,4-tetramethylbenzene	0.570%	114.6
1-ethyl-3,5-dimethylbenzene	0.054%	136.0
1-butanol	1.667%	62.0
1-ethoxy-2-propanol	2.400%	49.7
1,2-dimethyl-3-isopropylcyclopentane	0.018%	39.3
1-methoxy-2-propyl acetate	2.400%	32.3
1,3-ethylmethylcyclopentane	0.003%	44.2

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: coil coating

1,2,3,5-tetramethylbenzene	1.394%	136.0
(2-methylpropyl)cyclohexane	0.114%	42.7
1-ethyl-2-propylbenzene	0.012%	86.2
1,2,4,5-tetramethylbenzene	0.918%	114.6
1,2,3-trimethylbenzene	1.666%	126.7
1-ethyl-2,3-dimethylcyclohexane	0.027%	42.3
1-methoxy-2-propanol	2.400%	35.5
1,4-diethylbenzene	0.049%	89.6
1,2,3-trimethylcyclohexane	0.099%	45.4
1,1-dimethylcyclohexane	0.004%	42.8
1-ethyl-2-propylcyclohexane	0.024%	40.0
1,4-dimethyl-2-isopropylbenzene	0.008%	111.7
1,1,2-trimethylcyclohexane	0.048%	41.2
(1-methylpropyl)cyclohexane	0.211%	38.5

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

49 Paint: marine

Based on data provided by BCF - see naei99/rawdata/datafrmt/voc/species/paints_speciation_99.xls

Based on data provided by BCF - see naei99/rawdata/datafrmt/voc/species/paints_speciation_99.xls

Species	*% of total NMVOC*	*POCP*
1-methyl-3-isopropylcyclopentane	0.002%	39.1
2-methylheptane	0.014%	44.6
1-methylindan	0.019%	80.0
2,3-dimethyloctane	0.027%	40.2
2-butanone oxime	0.133%	51.3
1-methyl-4-isopropylbenzene	0.261%	89.6
2,4-dimethylheptane	0.014%	42.6
2,5-dimethyloctane	0.110%	40.2
2-methyldecane	0.260%	37.5
1-methyl-3-(isopropyl)benzene	0.077%	104.1
2,3-dimethylundecane	0.015%	31.7
2,5-dimethylhexane	0.002%	44.6
1-methyl-4-tertbutylbenzene	0.044%	87.3
2,4-dimethyl-1-(1-methylethyl)benzene	0.051%	111.7
1-methylindene	0.002%	136.2
2,3,5-trimethylhexane	0.002%	42.6
2,6-dimethyloctane	0.327%	40.2
1-methyl-2-isopropylbenzene	0.065%	88.4
2,3,3,4-tetramethylpentane	0.002%	37.2
2-methyldecalin	0.063%	41.4
2-ethyl-1,3-dimethylbenzene	0.083%	114.6
1-methyl-4-isopropylcyclohexane	0.270%	43.0
2,3,4-trimethylhexane	0.007%	42.9
2,2,5-trimethylhexane	0.007%	37.6
2,3-dimethylnonane	0.065%	37.7
1-methyl-2-propylbenzene	0.077%	88.4
2-methyl-5-ethyloctane	0.091%	38.0
2-ethoxyethyl acetate	1.000%	34.6
2-ethoxyethanol	1.000%	38.6
2,2,4-trimethyl-1,3-pentanediol monoisobutyrate	0.133%	27.5
2-methyl-1-butylbenzene	0.005%	86.2
2,2,3,3-tetramethylhexane	0.103%	19.2
2,6-dimethyldecane	0.043%	35.1
2,3-dimethylheptane	0.087%	42.6
2,6-dimethylundecane	0.010%	31.7

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: marine

2,7-dimethyloctane	0.065%	39.9
2,6-dimethylheptane	0.045%	42.3
1-methyl-3-propylbenzene	0.152%	104.1
2,5-dimethylheptane	0.041%	51.2
2,5-dimethyldecane	0.034%	34.6
1-methylbutylbenzene	0.042%	105.7
2-methyl-2,4-pentanediol	0.133%	46.4
3-ethyloctane	0.068%	44.4
2-methyloctane	0.120%	42.8
3-methyldecane	0.293%	37.7
3,5-dimethyloctane	0.029%	40.5
3-ethylhexane	0.002%	41.5
3,4-dimethylhexane	0.002%	45.3
4,6-dimethylindan	0.006%	132.5
2-methylnonane	0.349%	39.9
3,6-dimethyloctane	0.080%	40.5
4-methyldecane	0.490%	37.7
3,7-dimethylnonane	0.091%	37.9
3-methylhexane	0.002%	36.4
6-ethyl-2-methyloctane	0.015%	38.0
3-ethyl-2-methylheptane	0.395%	39.9
3-ethylheptane	0.087%	43.1
4-methyl-2-pentanone	1.500%	49.0
4,5-dimethylnonane	0.063%	37.9
3-methylundecane	0.050%	35.1
4-methyl-1,3-dioxol-2-one	0.133%	21.9
3-methyloctane	0.108%	42.6
2-propanol	0.833%	18.8
4-ethyloctane	0.031%	44.4
3-ethyltoluene	0.234%	101.9
3,3,4-trimethylhexane	0.002%	37.6
2-methylundecane	0.043%	35.2
3,3,5-trimethylheptane	0.009%	36.2
4,4-dimethylheptane	0.003%	37.2
4-ethyl-1,2-dimethylbenzene	0.056%	114.6
4-ethyltoluene	0.097%	90.6
3-ethyl-2-methylhexane	0.007%	43.1
3,3-dimethylheptane	0.010%	37.2
3,4-dimethylheptane	0.108%	42.6

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: marine

5-methyldecane	0.132%	37.7
3-methylnonane	0.404%	40.2
4-methylnonane	0.276%	40.2
6-ethyl-2-methyldecane	0.005%	32.8
5-methylundecane	0.041%	35.1
3-methylheptane	0.010%	45.0
4,7-dimethylindan	0.003%	132.5
3,3-dimethyloctane	0.092%	35.8
4-methyloctane	0.123%	42.3
4-propylheptane	0.005%	40.5
4-methylheptane	0.005%	45.0
butylcyclohexane	0.257%	42.5
dodecane	0.098%	35.7
dipentene	0.133%	74.5
C11 aromatic hydrocarbons	0.003%	134.2
ethylcyclohexane	0.092%	48.3
cyclohexanone	1.500%	29.9
butyrolactone	0.133%	51.3
C10 cycloalkanes	0.305%	38.4
ethyldimethylbenzene	0.980%	132.0
bis(2-hydroxyethyl)ether	0.133%	40.2
C8 alkanes	0.002%	42.2
cycloheptane	0.002%	53.4
C12 cycloalkanes	0.009%	35.7
ethanol	0.833%	39.9
decalin	0.089%	44.4
butyl acetate	1.000%	26.9
C9 cycloalkanes	0.017%	41.4
C9 alkanes	0.017%	40.4
butylbenzene	0.067%	69.0
6-methylundecane	0.033%	35.1
C11 alkanes	0.282%	36.4
decane	1.608%	38.4
diethylbenzene	0.280%	105.7
C13 alkanes	0.002%	31.7
ethylisopropylbenzene	0.003%	105.7
C11 cycloalkanes	0.021%	38.4
ethylbenzene	11.237%	73.0
C12 alkanes	0.091%	35.7

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: marine

dimethylformamide	0.133%	51.3
dimethylnonane	0.034%	38.4
C10 alkanes	0.241%	38.7
indan	0.059%	79.7
pentylbenzene	0.003%	67.3
heptane	0.003%	49.4
toluene	0.010%	63.7
propylcyclohexane	0.334%	45.4
octane	0.067%	45.3
methyltetralin	0.004%	114.0
propylene oxide	0.133%	13.4
o-xylene	6.808%	105.3
tert-butylcyclopropane	0.002%	11.5
m-xylene	30.833%	110.8
N-methyl pyrrolidone	0.133%	51.3
naphthalene	0.009%	97.7
phenol	0.133%	63.3
isopentylbenzene	0.010%	67.3
nitropentane	0.133%	18.5
tetramethylcyclohexane	0.050%	38.5
unspeciated	0.020%	51.3
propylcyclopentane	0.002%	44.5
tert-pentylbenzene	0.026%	67.3
nonane	0.928%	41.4
octahydroindan	0.046%	44.5
p-xylene	7.311%	101.0
pentylcyclohexane	0.063%	39.6
methylcyclodecane	0.014%	39.3
methylcyclohexane	0.015%	51.0
methylpropylbenzene	0.560%	105.7
isopropylbenzene	0.064%	50.0
pine oil	0.133%	74.5
methylethylbenzene	4.200%	94.1
undecane	0.841%	38.4
propylbenzene	0.706%	63.6
hexylcyclohexane	0.002%	36.7
unspeciated amines	0.133%	51.3
unspeciated cycloalkanes	0.010%	43.4
unspeciated alkanes	0.021%	36.8

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: marine

unspeciated aromatic hydrocarbons	0.700%	95.4
unspeciated hydrocarbons	0.086%	71.9
1,2,3-trimethylcyclopentane	0.003%	43.6
1-ethyl-3-methylcyclohexane	0.233%	45.6
1,1,2-trimethylcyclohexane	0.063%	41.2
1-ethyl-3,5-dimethylbenzene	0.072%	136.0
1,1,3-trimethylcyclohexane	0.072%	41.2
1,3-dimethyl-4-ethylbenzene	0.064%	114.6
1-ethyl-1,4-dimethylcyclohexane	0.031%	38.7
1,3-diethylbenzene	0.064%	104.1
1,2,4,4-tetramethylcyclopentane	0.012%	37.5
1,2,4,5-tetramethylbenzene	0.125%	114.6
1,2,3,5-tetramethylcyclohexane	0.070%	42.7
(2-methylbutyl)cyclohexane	0.021%	39.8
1-ethyl-2,3-dimethylbenzene	0.052%	114.6
1,3,5-trimethylbenzene	1.343%	138.1
1-ethyl-2-propylcyclohexane	0.033%	40.0
1-methyl-1-propylcyclopentane	0.039%	37.9
1,2,3-trimethylcyclohexane	0.132%	45.4
1-ethyl-2,3-dimethylcyclohexane	0.036%	42.3
1,2,3-trimethylbenzene	1.180%	126.7
1-ethyl-2-propylbenzene	0.017%	86.2
1-ethyl-2,2,6-trimethylcyclohexane	0.079%	37.2
1,1-dimethylcyclohexane	0.005%	42.8
1-ethylpropylbenzene	0.019%	105.7
1,3-dimethyl-5-propylbenzene	0.008%	132.5
(1-methylpropyl)cyclohexane	0.281%	38.5
(2-methylpropyl)cyclohexane	0.152%	42.7
1,4-dimethylcyclohexane	0.074%	48.2
1,2,4-trimethylbenzene	4.801%	127.8
1,4-dimethyl-2-isopropylbenzene	0.010%	111.7
(1-methylethyl)cyclohexane	0.156%	40.5
1,1,4,4-tetramethylcyclohexane	0.045%	34.3
1,4-diethylbenzene	0.065%	89.6
1,2-dimethyl-3-isopropylcyclopentane	0.024%	39.3
1,3-dimethylcyclohexane	0.029%	48.2
1,2-dimethylcyclohexane	0.033%	48.2
1,3-ethylmethylcyclopentane	0.003%	44.2
1,2,4-trimethylcyclohexane	0.041%	45.4

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: marine

1,2-ethylmethylcyclopentane	0.005%	44.2
1-methoxy-2-propyl acetate	1.000%	32.3
1,2,3,4-tetramethylbenzene	0.128%	114.6
1-ethyl-4-methylcyclohexane	0.099%	45.6
1-methyl-1-phenylcyclopropane	0.014%	63.7
1,2,4-trimethlycyclopentane	0.002%	43.6
1,2,3,4-tetrahydronaphthalene	0.027%	115.1
1-butanol	3.333%	62.0
1,2,3,5-tetramethylbenzene	0.137%	136.0
1,2-propanediol	0.133%	44.6

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

50 Paint: heavy duty

Based on data provided by BCF - see naei99/rawdata/datafrmt/voc/species/paints_speciation_99.xls

Based on data provided by BCF - see naei99/rawdata/datafrmt/voc/species/paints_speciation_99.xls

Species	*% of total NMVOC*	*POCP*
2-methyldecalin	0.060%	41.4
2,6-dimethyloctane	0.311%	40.2
2,3,3,4-tetramethylpentane	0.002%	37.2
2,2,5-trimethylhexane	0.007%	37.6
1-methylbutylbenzene	0.040%	105.7
1-methyl-3-propylbenzene	0.145%	104.1
2,3-dimethylundecane	0.015%	31.7
2-methyldecane	0.247%	37.5
1-methyl-3-isopropylcyclopentane	0.002%	39.1
2,5-dimethylheptane	0.039%	51.2
1-methyl-4-tertbutylbenzene	0.041%	87.3
2,6-dimethylheptane	0.042%	42.3
2,4-dimethyl-1-(1-methylethyl)benzene	0.049%	111.7
2-butanone	1.333%	37.3
2,3-dimethylheptane	0.083%	42.6
2,3-dimethylnonane	0.062%	37.7
2-methyl-5-ethyloctane	0.086%	38.0
1-methyl-3-(isopropyl)benzene	0.073%	104.1
2,6-dimethylundecane	0.010%	31.7
2,5-dimethyldecane	0.033%	34.6
2,3-dimethyloctane	0.026%	40.2
1-methyl-2-isopropylbenzene	0.062%	88.4
2,3,4-trimethylhexane	0.007%	42.9
2,3-dimethylbutane	0.038%	54.1
1-methylindene	0.002%	136.2
2,6-dimethyldecane	0.041%	35.1
2-methylheptane	0.013%	44.6
2,3-dimethylpentane	0.043%	39.1
2-methyl-1-butylbenzene	0.005%	86.2
2,5-dimethyloctane	0.104%	40.2
2,2,3,3-tetramethylhexane	0.098%	19.2
2-ethyl-1,3-dimethylbenzene	0.079%	114.6
1-methyl-4-isopropylcyclohexane	0.257%	43.0
2-ethoxyethanol	1.000%	38.6
2,4-dimethylheptane	0.013%	42.6

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: heavy duty

1-methyl-2-propylbenzene	0.073%	88.4
2,7-dimethyloctane	0.062%	39.9
2,5-dimethylhexane	0.002%	44.6
2,2-dimethylpentane	0.043%	38.6
1-methyl-4-isopropylbenzene	0.248%	89.6
2,4-dimethylpentane	0.043%	46.6
2-methyl-1-propanol	0.545%	36.0
1-methylindan	0.018%	80.0
2,3,5-trimethylhexane	0.002%	42.6
2-butanol	0.545%	44.7
2-ethoxyethyl acetate	1.000%	34.6
5-methyldecane	0.125%	37.7
3-ethyltoluene	0.223%	101.9
3-ethyloctane	0.065%	44.4
3-ethylheptane	0.083%	43.1
4-methylheptane	0.005%	45.0
4,4-dimethylheptane	0.003%	37.2
3-ethylhexane	0.002%	41.5
3-methylundecane	0.047%	35.1
3-methyldecane	0.278%	37.7
4-methyloctane	0.117%	42.3
4,7-dimethylindan	0.002%	132.5
3,3,4-trimethylhexane	0.002%	37.6
2-propanol	0.545%	18.8
4-ethyloctane	0.029%	44.4
2-methylundecane	0.041%	35.2
4-ethyl-1,2-dimethylbenzene	0.054%	114.6
6-ethyl-2-methyldecane	0.005%	32.8
3,3-dimethylheptane	0.010%	37.2
2-methylpentane	0.380%	42.0
2-methyloctane	0.114%	42.8
2-methylnonane	0.332%	39.9
2-methylhexane	0.304%	41.1
4-methyl-2-pentanone	1.333%	49.0
6-ethyl-2-methyloctane	0.015%	38.0
4-ethyltoluene	0.092%	90.6
4-propylheptane	0.005%	40.5
4,5-dimethylnonane	0.060%	37.9
3-ethyl-2-methylheptane	0.376%	39.9

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: heavy duty

3,7-dimethylnonane	0.086%	37.9
3,6-dimethyloctane	0.076%	40.5
3,5-dimethyloctane	0.028%	40.5
3,3,5-trimethylheptane	0.008%	36.2
3,4-dimethylhexane	0.002%	45.3
3-ethyl-2-methylhexane	0.007%	43.1
4-methyl-4-hydroxy-2-pentanone	0.545%	30.7
3,4-dimethylheptane	0.102%	42.6
3,3-dimethylpentane	0.043%	37.8
3,3-dimethyloctane	0.088%	35.8
4-methylnonane	0.262%	40.2
5-methylundecane	0.039%	35.1
4,6-dimethylindan	0.006%	132.5
3-methylheptane	0.010%	45.0
4-methyldecane	0.465%	37.7
3-methylhexane	0.306%	36.4
3-methyloctane	0.102%	42.6
3-methylpentane	0.342%	47.9
3-methylnonane	0.384%	40.2
cyclohexane	0.361%	29.0
ethylbenzene	5.991%	73.0
C12 cycloalkanes	0.008%	35.7
C9 cycloalkanes	0.016%	41.4
cyclohexanone	1.333%	29.9
ethanol	0.545%	39.9
C11 aromatic hydrocarbons	0.002%	134.2
ethylcyclohexane	0.088%	48.3
butylbenzene	0.063%	69.0
C11 alkanes	0.268%	36.4
C13 alkanes	0.002%	31.7
dimethylnonane	0.033%	38.4
C11 cycloalkanes	0.020%	38.4
C10 alkanes	0.229%	38.7
6-methylundecane	0.031%	35.1
C9 alkanes	0.016%	40.4
ethylisopropylbenzene	0.002%	105.7
decane	1.527%	38.4
diethylbenzene	0.149%	105.7
dimethylcyclopentane	0.171%	45.8

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: heavy duty

C12 alkanes	0.086%	35.7
butylcyclohexane	0.244%	42.5
ethyldimethylbenzene	0.521%	132.0
cycloheptane	0.002%	53.4
C10 cycloalkanes	0.289%	38.4
decalin	0.085%	44.4
benzyl alcohol	0.545%	46.9
dodecane	0.093%	35.7
C8 alkanes	0.002%	42.2
methylcyclodecane	0.013%	39.3
methylethylbenzene	2.233%	94.1
propylcyclohexane	0.317%	45.4
methyltetralin	0.004%	114.0
m-xylene	16.409%	110.8
toluene	29.788%	63.7
isopentylbenzene	0.010%	67.3
p-xylene	3.900%	101.0
isopropylbenzene	0.061%	50.0
methylpropylbenzene	0.298%	105.7
pentylcyclohexane	0.060%	39.6
unspeciated	0.019%	51.3
propylcyclopentane	0.002%	44.5
octane	0.063%	45.3
propylbenzene	0.436%	63.6
nonane	0.882%	41.4
undecane	0.799%	38.4
tert-pentylbenzene	0.024%	67.3
tetramethylcyclohexane	0.047%	38.5
hexylcyclohexane	0.002%	36.7
methylcyclohexane	0.148%	51.0
methanol	0.545%	14.0
hexane	0.988%	48.2
o-xylene	3.657%	105.3
octahydroindan	0.044%	44.5
indan	0.056%	79.7
pentylbenzene	0.002%	67.3
tert-butylcyclopropane	0.002%	11.5
heptane	0.364%	49.4
methylcyclopentane	0.247%	48.1

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: heavy duty

naphthalene	0.009%	97.7
unspeciated aromatic hydrocarbons	0.372%	95.4
unspeciated hydrocarbons	0.081%	71.9
unspeciated alkanes	0.020%	36.8
unspeciated cycloalkanes	0.010%	43.4
1,2-dimethyl-3-isopropylcyclopentane	0.023%	39.3
1,2,4-trimethylcyclohexane	0.039%	45.4
1,1,3-trimethylcyclohexane	0.068%	41.2
1,2-dimethylcyclohexane	0.031%	48.2
1,1,4,4-tetramethylcyclohexane	0.042%	34.3
1,2,3-trimethylbenzene	0.711%	126.7
1,2,4,5-tetramethylbenzene	0.080%	114.6
1,2,3-trimethylcyclohexane	0.125%	45.4
1,2,4-trimethlycyclopentane	0.002%	43.6
1,2,3,5-tetramethylcyclohexane	0.067%	42.7
1,1-dimethylcyclohexane	0.005%	42.8
1,2-ethylmethylcyclopentane	0.005%	44.2
(2-methylpropyl)cyclohexane	0.145%	42.7
1,2,3-trimethylcyclopentane	0.003%	43.6
1,1,2-trimethylcyclohexane	0.060%	41.2
1,2,3,5-tetramethylbenzene	0.091%	136.0
1,2,3,4-tetrahydronaphthalene	0.026%	115.1
1,2,3,4-tetramethylbenzene	0.082%	114.6
1,2,4-trimethylbenzene	2.746%	127.8
1,2,4,4-tetramethylcyclopentane	0.011%	37.5
1,3,5-trimethylbenzene	0.807%	138.1
1-methoxy-2-propyl acetate	1.000%	32.3
1-butanol	2.182%	62.0
1-ethyl-2,3-dimethylcyclohexane	0.034%	42.3
1,4-dimethyl-2-isopropylbenzene	0.010%	111.7
1-ethyl-2,2,6-trimethylcyclohexane	0.075%	37.2
(2-methylbutyl)cyclohexane	0.020%	39.8
1,3-diethylbenzene	0.061%	104.1
1-ethyl-4-methylcyclohexane	0.094%	45.6
(1-methylethyl)cyclohexane	0.148%	40.5
1-ethyl-2-propylcyclohexane	0.031%	40.0
1-ethylpropylbenzene	0.018%	105.7
1-ethyl-2,3-dimethylbenzene	0.050%	114.6
1-methoxy-2-propanol	1.000%	35.5

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: heavy duty

1-ethyl-2-propylbenzene	0.016%	86.2
1,4-dimethylcyclohexane	0.070%	48.2
1,3-dimethyl-4-ethylbenzene	0.061%	114.6
1,3-dimethyl-5-propylbenzene	0.007%	132.5
1,4-diethylbenzene	0.062%	89.6
1-methyl-1-propylcyclopentane	0.037%	37.9
1-ethyl-1,4-dimethylcyclohexane	0.029%	38.7
(1-methylpropyl)cyclohexane	0.267%	38.5
1-ethyl-3,5-dimethylbenzene	0.068%	136.0
1-ethyl-3-methylcyclohexane	0.221%	45.6
1-methyl-1-phenylcyclopropane	0.013%	63.7
1,3-dimethylcyclohexane	0.028%	48.2
1,3-ethylmethylcyclopentane	0.003%	44.2

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

51 Paint: general industrial

Based on data provided by BCF - see naei99/rawdata/datafrmt/voc/species/paints_speciation_99.xls

Based on data provided by BCF - see naei99/rawdata/datafrmt/voc/species/paints_speciation_99.xls

Species	*% of total NMVOC*	*POCP*
1-methylindene	0.001%	136.2
2,3,4-trimethylhexane	0.004%	42.9
2-methyldecalin	0.038%	41.4
2,4-dimethylpentane	0.027%	46.6
2,3-dimethylpentane	0.027%	39.1
2-methyl-1-butylbenzene	0.003%	86.2
2,6-dimethyloctane	0.196%	40.2
2,5-dimethyloctane	0.066%	40.2
2-methylheptane	0.008%	44.6
2-butoxyethanol	1.067%	48.3
2,3-dimethylnonane	0.039%	37.7
2-(2-ethoxyethoxy)ethanol	0.267%	49.3
2-(2-butoxyethoxy)ethanol	0.267%	50.2
1-methyl-3-(isopropyl)benzene	0.046%	104.1
2,6-dimethylundecane	0.006%	31.7
2,3,5-trimethylhexane	0.001%	42.6
2-ethoxyethyl acetate	0.267%	34.6
2,3,3,4-tetramethylpentane	0.001%	37.2
2-methyl-1-propanol	3.048%	36.0
2,7-dimethyloctane	0.039%	39.9
2,3-dimethyloctane	0.016%	40.2
2-ethyl-1,3-dimethylbenzene	0.050%	114.6
2-butanone oxime	0.216%	51.3
2,5-dimethylheptane	0.025%	51.2
1-methyl-3-propylbenzene	0.091%	104.1
2,3-dimethylheptane	0.052%	42.6
2,5-dimethyldecane	0.021%	34.6
2,2,5-trimethylhexane	0.004%	37.6
1-methylindan	0.012%	80.0
2-ethoxyethanol	0.267%	38.6
2,6-dimethylheptane	0.027%	42.3
2-butanol	3.048%	44.7
2,6-dimethyldecane	0.026%	35.1
1-methyl-4-tertbutylbenzene	0.026%	87.3
2,2-dimethylpentane	0.027%	38.6

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: general industrial

2,5-dimethylhexane	0.001%	44.6
2,4-dimethyl-1-(1-methylethyl)benzene	0.031%	111.7
2-methyl-5-ethyloctane	0.054%	38.0
1-methyl-2-propylbenzene	0.046%	88.4
1-methyl-4-isopropylbenzene	0.157%	89.6
2-butanone	2.560%	37.3
1-methyl-4-isopropylcyclohexane	0.162%	43.0
2-butoxyethyl acetate	0.267%	35.1
1-methyl-3-isopropylcyclopentane	0.001%	39.1
1-methylbutylbenzene	0.025%	105.7
2,3-dimethylundecane	0.009%	31.7
2,3-dimethylbutane	0.024%	54.1
1-methyl-2-isopropylbenzene	0.039%	88.4
2,4-dimethylheptane	0.008%	42.6
2,2,3,3-tetramethylhexane	0.062%	19.2
2-methyldecane	0.156%	37.5
3-methyloctane	0.065%	42.6
4-ethyl-1,2-dimethylbenzene	0.034%	114.6
3-ethyltoluene	0.141%	101.9
4,6-dimethylindan	0.004%	132.5
3,5-dimethyloctane	0.017%	40.5
2-methylundecane	0.026%	35.2
4-methylheptane	0.003%	45.0
4,4-dimethylheptane	0.002%	37.2
3-pentanone	0.480%	41.4
3,4-dimethylhexane	0.001%	45.3
4-ethyloctane	0.018%	44.4
4-ethyltoluene	0.058%	90.6
3,3,4-trimethylhexane	0.001%	37.6
5-methylundecane	0.025%	35.1
3-methylnonane	0.242%	40.2
3,3-dimethylheptane	0.006%	37.2
3,3,5-trimethylheptane	0.005%	36.2
4-methylnonane	0.165%	40.2
4-methyldecane	0.294%	37.7
3,3-dimethylpentane	0.027%	37.8
2-propanol	0.762%	18.8
3-ethyloctane	0.041%	44.4
2-propyl acetate	0.577%	21.1

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: general industrial

4,7-dimethylindan	0.002%	132.5
3,4-dimethylheptane	0.065%	42.6
5-methyldecane	0.079%	37.7
6-ethyl-2-methyldecane	0.003%	32.8
3,3-dimethyloctane	0.055%	35.8
3,7-dimethylnonane	0.054%	37.9
5-methyl-2-hexanone	0.500%	51.6
6-ethyl-2-methyloctane	0.009%	38.0
3-methylpentane	0.216%	47.9
3-ethyl-2-methylhexane	0.004%	43.1
3-ethylheptane	0.052%	43.1
2-methylhexane	0.192%	41.1
4-methyl-2-pentanone	0.560%	49.0
4,5-dimethylnonane	0.038%	37.9
3-ethyl-2-methylheptane	0.237%	39.9
2-methylnonane	0.210%	39.9
4-methyloctane	0.074%	42.3
3-methylhexane	0.193%	36.4
2-methyloctane	0.072%	42.8
4-propylheptane	0.003%	40.5
2-methylpentane	0.240%	42.0
3-methylundecane	0.030%	35.1
3,6-dimethyloctane	0.048%	40.5
3-methyldecane	0.176%	37.7
4-methyl-4-hydroxy-2-pentanone	3.048%	30.7
3-methylheptane	0.006%	45.0
3-ethylhexane	0.001%	41.5
C11 cycloalkanes	0.012%	38.4
ethylbenzene	3.051%	73.0
cyclohexane	0.228%	29.0
C13 alkanes	0.001%	31.7
6-methylundecane	0.020%	35.1
8-methyl-1-nonanol	0.762%	50.2
butylbenzene	0.040%	69.0
ethylcyclohexane	0.055%	48.3
C12 cycloalkanes	0.005%	35.7
ethyldimethylbenzene	2.006%	132.0
cycloheptane	0.001%	53.4
C12 alkanes	0.054%	35.7

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: general industrial

butylcyclohexane	0.154%	42.5
C11 aromatic hydrocarbons	0.002%	134.2
acetone	2.400%	9.4
ethylisopropylbenzene	0.002%	105.7
ethyl acetate	1.907%	20.9
C8 alkanes	0.001%	42.2
C10 cycloalkanes	0.183%	38.4
dipentene	0.216%	74.5
cyclohexanone	0.500%	29.9
ethanol	0.762%	39.9
dimethylnonane	0.021%	38.4
decalin	0.053%	44.4
dimethylcyclopentane	0.108%	45.8
dodecane	0.059%	35.7
cyclohexanol	0.762%	51.8
diethylbenzene	0.379%	105.7
C11 alkanes	0.169%	36.4
butyl acetate	1.667%	26.9
C10 alkanes	0.145%	38.7
ethyl lactate	0.417%	32.8
decane	0.965%	38.4
dichloromethane	0.306%	6.8
C9 cycloalkanes	0.010%	41.4
C9 alkanes	0.010%	40.4
unspeciated	0.012%	51.3
nonane	0.557%	41.4
octahydroindan	0.028%	44.5
methyltetralin	0.002%	114.0
methylindane	0.151%	80.0
methanol	0.762%	14.0
trichloroethene	0.306%	32.5
tert-butylcyclopropane	0.001%	11.5
hexylcyclohexane	0.001%	36.7
methylpropylbenzene	0.946%	105.7
pentylcyclohexane	0.038%	39.6
o-xylene	1.870%	105.3
styrene	3.786%	14.2
octane	0.040%	45.3
m-xylene	8.349%	110.8

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: general industrial

heptane	0.230%	49.4
indan	0.111%	79.7
toluene	15.149%	63.7
nitropentane	0.216%	18.5
phenol	0.216%	63.3
naphthalene	0.195%	97.7
isopentylbenzene	0.006%	67.3
isophorone	0.500%	77.6
isopropylbenzene	0.038%	50.0
propylbenzene	0.693%	63.6
methylcyclodecane	0.008%	39.3
methylethylbenzene	4.694%	94.1
pentylbenzene	0.002%	67.3
propylcyclohexane	0.200%	45.4
p-xylene	1.987%	101.0
propyl acetate	0.100%	28.2
methylcyclohexane	0.093%	51.0
tetramethylcyclohexane	0.030%	38.5
hexane	0.624%	48.2
propylcyclopentane	0.001%	44.5
tert-pentylbenzene	0.015%	67.3
undecane	0.504%	38.4
methylcyclopentane	0.156%	48.1
unspeciated amines	0.216%	51.3
unspeciated alkanes	0.012%	36.8
unspeciated cycloalkanes	0.006%	43.4
unspeciated hydrocarbons	0.051%	71.9
unspeciated aromatic hydrocarbons	1.060%	95.4
1,2,3,4-tetrahydronaphthalene	0.016%	115.1
1,4-dimethylcyclohexane	0.044%	48.2
1,3-ethylmethylcyclopentane	0.002%	44.2
1,2,3,5-tetramethylbenzene	0.543%	136.0
1-ethyl-2-propylbenzene	0.010%	86.2
1,2-ethylmethylcyclopentane	0.003%	44.2
1-ethyl-3-methylcyclohexane	0.140%	45.6
1,2,4-trimethylcyclohexane	0.025%	45.4
1-ethylpropylbenzene	0.012%	105.7
1,2,4,4-tetramethylcyclopentane	0.007%	37.5
1,4-dimethyl-2-isopropylbenzene	0.006%	111.7

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: general industrial

1,3-dimethyl-5-propylbenzene	0.005%	132.5
1,2-dimethylcyclohexane	0.020%	48.2
(1-methylethyl)cyclohexane	0.093%	40.5
1,2,3,5-tetramethylcyclohexane	0.042%	42.7
1,2,3,4-tetramethylbenzene	0.273%	114.6
1,2,3-trimethylbenzene	1.407%	126.7
1,2-ethanedioldiacetate	0.417%	16.0
1,2,3-trimethylcyclohexane	0.079%	45.4
1,3-dimethylcyclohexane	0.017%	48.2
1-ethyl-2-propylcyclohexane	0.020%	40.0
1,1,2-trimethylcyclohexane	0.038%	41.2
1-ethyl-4-methylcyclohexane	0.060%	45.6
1,4-diethylbenzene	0.039%	89.6
1-ethyl-3,5-dimethylbenzene	0.043%	136.0
1,1,1-trichloroethane	0.306%	0.9
1-ethyl-2,2,6-trimethylcyclohexane	0.047%	37.2
1,3,5-trimethylbenzene	1.421%	138.1
1,3-dimethyl-4-ethylbenzene	0.038%	114.6
1,2-dimethyl-3-isopropylcyclopentane	0.014%	39.3
1-methoxy-2-propyl acetate	0.267%	32.3
1-ethyl-2,3-dimethylcyclohexane	0.022%	42.3
(2-methylbutyl)cyclohexane	0.012%	39.8
1-butanol	3.048%	62.0
1,2,4-trimethylbenzene	5.387%	127.8
1-methyl-1-phenylcyclopropane	0.008%	63.7
1-ethyl-1,4-dimethylcyclohexane	0.018%	38.7
1,2,4,5-tetramethylbenzene	0.385%	114.6
1,2,4-trimethlycyclopentane	0.001%	43.6
1,1,3-trimethylcyclohexane	0.043%	41.2
1-methyl-1-propylcyclopentane	0.024%	37.9
(1-methylpropyl)cyclohexane	0.168%	38.5
1,1,4,4-tetramethylcyclohexane	0.027%	34.3
1-methoxy-2-propanol	1.067%	35.5
(2-methylpropyl)cyclohexane	0.091%	42.7
1,1-dimethylcyclohexane	0.003%	42.8
1-ethyl-2,3-dimethylbenzene	0.031%	114.6
1,2,3-trimethylcyclopentane	0.002%	43.6
(2-methyl-1-propyl)acetate	0.417%	32.8
1,3-diethylbenzene	0.038%	104.1

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: general industrial

1-(2-butoxy-1-methyl-ethoxy)-2-propanol	0.267%	41.3

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

52 Paint: metal packaging

Based on data provided by BCF - see naei99/rawdata/datafrmt/voc/species/paints_speciation_99.xls

Based on data provided by BCF - see naei99/rawdata/datafrmt/voc/species/paints_speciation_99.xls

Species	*% of total NMVOC*	*POCP*
2,3-dimethylbutane	0.010%	54.1
2,3,5-trimethylhexane	0.000%	42.6
1-methyl-4-isopropylcyclohexane	0.017%	43.0
2,3-dimethylnonane	0.004%	37.7
2,5-dimethyldecane	0.002%	34.6
1-methyl-4-isopropylbenzene	0.016%	89.6
2,6-dimethylheptane	0.003%	42.3
2-butoxyethanol	1.300%	48.3
2-ethyl-1,3-dimethylbenzene	0.005%	114.6
2-ethoxyethanol	1.300%	38.6
2-ethoxyethyl acetate	1.300%	34.6
1-methyl-2-propylbenzene	0.005%	88.4
2,6-dimethyldecane	0.003%	35.1
2,3-dimethylheptane	0.005%	42.6
2,2,3,3-tetramethylhexane	0.006%	19.2
2-methyldecane	0.016%	37.5
2,3,4-trimethylhexane	0.000%	42.9
2-methyl-1-butylbenzene	0.000%	86.2
2,2,5-trimethylhexane	0.000%	37.6
2-butoxyethyl acetate	1.300%	35.1
1-methyl-3-propylbenzene	0.010%	104.1
1-methylbutylbenzene	0.003%	105.7
2-hexoxyethanol	1.300%	44.7
2,5-dimethylhexane	0.000%	44.6
1-methyl-2-isopropylbenzene	0.004%	88.4
2-[2-(2-ethoxy-ethoxy)-ethoxy]ethanol	1.300%	35.7
2-butanol	1.800%	44.7
2-methyl-2,4-pentanediol	0.286%	46.4
2-acetoxy-propyl acetate	1.300%	14.3
2,5-dimethyloctane	0.007%	40.2
2,6-dimethyloctane	0.020%	40.2
2-methyldecalin	0.004%	41.4
1-methylindene	0.000%	136.2
1-methyl-4-tertbutylbenzene	0.003%	87.3
1-methyl-3-isopropylcyclopentane	0.000%	39.1

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: metal packaging

1-methylindan	0.001%	80.0
2,2-dimethylpentane	0.011%	38.6
2,3-dimethylundecane	0.001%	31.7
2,4-dimethyl-1-(1-methylethyl)benzene	0.003%	111.7
2-butanone	5.091%	37.3
2-methyl-5-ethyloctane	0.006%	38.0
2,3-dimethylpentane	0.011%	39.1
2-(2-butoxyethoxy)ethanol	1.300%	50.2
2-methylheptane	0.001%	44.6
2,5-dimethylheptane	0.003%	51.2
2-(2-ethoxyethoxy)ethanol	1.300%	49.3
1-methyl-3-(isopropyl)benzene	0.005%	104.1
2,7-dimethyloctane	0.004%	39.9
2,4-dimethylpentane	0.011%	46.6
2,3,3,4-tetramethylpentane	0.000%	37.2
2,6-dimethylundecane	0.001%	31.7
2-methyl-1-propanol	1.800%	36.0
2,3-dimethyloctane	0.002%	40.2
2,4-dimethylheptane	0.001%	42.6
3,3-dimethyloctane	0.006%	35.8
3-ethylheptane	0.005%	43.1
4-methyldecane	0.031%	37.7
3,3-dimethylpentane	0.011%	37.8
4-methyl-4-hydroxy-2-pentanone	1.800%	30.7
3-ethyl-2-methylhexane	0.000%	43.1
3-methylnonane	0.025%	40.2
3,5-dimethyloctane	0.002%	40.5
3-ethylhexane	0.000%	41.5
3,7-dimethylnonane	0.006%	37.9
3-ethyloctane	0.004%	44.4
4,4-dimethylheptane	0.000%	37.2
5-methyldecane	0.008%	37.7
3-ethyl-2-methylheptane	0.025%	39.9
4-methylheptane	0.000%	45.0
4,5-dimethylnonane	0.004%	37.9
4,6-dimethylindan	0.000%	132.5
3-methylhexane	0.080%	36.4
3,4-dimethylheptane	0.007%	42.6
3,4-dimethylhexane	0.000%	45.3

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: metal packaging

3,6-dimethyloctane	0.005%	40.5
4,7-dimethylindan	0.000%	132.5
4-methyloctane	0.008%	42.3
2-propanol	1.800%	18.8
3-methylheptane	0.001%	45.0
4-ethyloctane	0.002%	44.4
2-methylundecane	0.003%	35.2
4-ethyltoluene	0.006%	90.6
4-methylnonane	0.017%	40.2
6-ethyl-2-methyldecane	0.000%	32.8
2-propyl acetate	1.286%	21.1
3-methylundecane	0.003%	35.1
3-methyloctane	0.007%	42.6
3-methyldecane	0.018%	37.7
2-methyloctane	0.007%	42.8
2-methylnonane	0.022%	39.9
4-methyl-2-pentanone	5.091%	49.0
2-methylhexane	0.080%	41.1
3-methylpentane	0.090%	47.9
6-ethyl-2-methyloctane	0.001%	38.0
2-methylpentane	0.100%	42.0
4-ethyl-1,2-dimethylbenzene	0.004%	114.6
3,3,4-trimethylhexane	0.000%	37.6
4-propylheptane	0.000%	40.5
3-ethyltoluene	0.015%	101.9
3,3-dimethylheptane	0.001%	37.2
3,3,5-trimethylheptane	0.001%	36.2
5-methylundecane	0.003%	35.1
dimethylnonane	0.002%	38.4
C11 aromatic hydrocarbons	0.000%	134.2
acetone	1.273%	9.4
decalin	0.006%	44.4
C11 cycloalkanes	0.001%	38.4
C12 alkanes	0.006%	35.7
C10 alkanes	0.015%	38.7
butylcyclohexane	0.016%	42.5
decane	0.100%	38.4
diethylbenzene	0.517%	105.7
ethylisopropylbenzene	0.000%	105.7

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: metal packaging

6-methylundecane	0.002%	35.1
dimethylformamide	0.286%	51.3
dimethylcyclopentane	0.045%	45.8
C9 alkanes	0.001%	40.4
dipentene	0.286%	74.5
ethylcyclohexane	0.006%	48.3
cyclohexane	0.095%	29.0
C9 cycloalkanes	0.001%	41.4
ethylbenzene	2.587%	73.0
C13 alkanes	0.000%	31.7
C11 alkanes	0.018%	36.4
dodecane	0.006%	35.7
butyl acetate	1.286%	26.9
ethyl acetate	5.143%	20.9
butylbenzene	0.004%	69.0
ethanol	1.800%	39.9
C12 cycloalkanes	0.001%	35.7
cycloheptane	0.000%	53.4
C10 cycloalkanes	0.019%	38.4
benzyl alcohol	1.800%	46.9
C8 alkanes	0.000%	42.2
cyclohexanone	1.273%	29.9
ethyldimethylbenzene	4.135%	132.0
butyrolactone	0.286%	51.3
methylindane	0.517%	80.0
naphthalene	0.647%	97.7
isopropylbenzene	0.004%	50.0
heptane	0.095%	49.4
unspeciated	0.001%	51.3
tert-butylcyclopropane	0.000%	11.5
propylene oxide	0.286%	13.4
propylcyclohexane	0.021%	45.4
o-xylene	1.556%	105.3
undecane	0.053%	38.4
nonane	0.058%	41.4
propylcyclopentane	0.000%	44.5
methyltetralin	0.000%	114.0
m-xylene	7.110%	110.8
methylcyclodecane	0.001%	39.3

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: metal packaging

propylbenzene	0.526%	63.6
octahydroindan	0.003%	44.5
methylethylbenzene	4.394%	94.1
methylcyclohexane	0.036%	51.0
isophorone	1.273%	77.6
pentylcyclohexane	0.004%	39.6
hexylcyclohexane	0.000%	36.7
methylpropylbenzene	1.680%	105.7
pine oil	0.286%	74.5
tert-pentylbenzene	0.002%	67.3
tetramethylcyclohexane	0.003%	38.5
methylcyclopentane	0.065%	48.1
toluene	3.231%	63.7
indan	0.262%	79.7
p-xylene	1.682%	101.0
pentylbenzene	0.000%	67.3
hexane	0.260%	48.2
isopentylbenzene	0.001%	67.3
octane	0.004%	45.3
unspeciated alkanes	0.001%	36.8
unspeciated cycloalkanes	0.001%	43.4
unspeciated hydrocarbons	0.005%	71.9
unspeciated aromatic hydrocarbons	1.680%	95.4
(2-methyl-1-propyl)acetate	1.286%	32.8
(1-methylpropyl)cyclohexane	0.018%	38.5
(1-methylethyl)cyclohexane	0.010%	40.5
1,2,3-trimethylbenzene	1.692%	126.7
(2-methylpropyl)cyclohexane	0.010%	42.7
1-ethyl-2,3-dimethylcyclohexane	0.002%	42.3
1,2-dimethyl-3-isopropylcyclopentane	0.001%	39.3
1,4-dimethylcyclohexane	0.005%	48.2
1-ethyl-3,5-dimethylbenzene	0.004%	136.0
1,2,4-trimethlycyclopentane	0.000%	43.6
1,2,4,5-tetramethylbenzene	0.993%	114.6
1,2,3-trimethylcyclohexane	0.008%	45.4
1-butanol	7.200%	62.0
1-ethyl-2,3-dimethylbenzene	0.003%	114.6
1,2,4-trimethylbenzene	5.456%	127.8
1,2,4-trimethylcyclohexane	0.003%	45.4

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paint: metal packaging

1,4-diethylbenzene	0.004%	89.6
1-ethyl-2-propylbenzene	0.001%	86.2
1-ethyl-1,4-dimethylcyclohexane	0.002%	38.7
1,2,3,5-tetramethylcyclohexane	0.004%	42.7
1-ethyl-2-propylcyclohexane	0.002%	40.0
1,2,4,4-tetramethylcyclopentane	0.001%	37.5
1-ethyl-2,2,6-trimethylcyclohexane	0.005%	37.2
1,4-dimethyl-2-isopropylbenzene	0.001%	111.7
1,2,3-trimethylcyclopentane	0.000%	43.6
1-ethoxy-2-propanol	1.300%	49.7
1,3,5-trimethylbenzene	1.306%	138.1
1,2-ethylmethylcyclopentane	0.000%	44.2
1,2,3,4-tetrahydronaphthalene	0.002%	115.1
1-ethylpropylbenzene	0.001%	105.7
1,3-dimethyl-5-propylbenzene	0.000%	132.5
1,3-dimethyl-4-ethylbenzene	0.004%	114.6
1,2,3,4-tetramethylbenzene	0.605%	114.6
1,1-dimethylcyclohexane	0.000%	42.8
1,3-diethylbenzene	0.004%	104.1
1,1,2-trimethylcyclohexane	0.004%	41.2
(2-methylbutyl)cyclohexane	0.001%	39.8
1,2-propanediol	0.286%	44.6
1-ethyl-4-methylcyclohexane	0.006%	45.6
1,2-dimethylcyclohexane	0.002%	48.2
1,3-dimethylcyclohexane	0.002%	48.2
1-methyl-1-propylcyclopentane	0.002%	37.9
1,1,3-trimethylcyclohexane	0.004%	41.2
1-ethyl-3-methylcyclohexane	0.015%	45.6
1,2,3,5-tetramethylbenzene	1.510%	136.0
1-methyl-1-phenylcyclopropane	0.001%	63.7
1,1,4,4-tetramethylcyclohexane	0.003%	34.3
1,3-ethylmethylcyclopentane	0.000%	44.2

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

53 Rubber processes

Based on SIA data - see naei99/rawdata/datafrmt/voc/species/rubber_processes.xls

Based on SIA data - see naei99/rawdata/datafrmt/voc/species/rubber_processes.xls

Species	*% of total NMVOC*	*POCP*
2,4-dimethylpentane	0.610%	46.6
2,3-dimethylbutane	0.540%	54.1
1-propanol	1.320%	56.1
2,2-dimethylpentane	0.610%	38.6
2,3-dimethylpentane	0.610%	39.1
3-methylpentane	4.900%	47.9
2-methylhexane	4.360%	41.1
4-methyl-2-pentanone	9.610%	49.0
3-methylhexane	4.360%	36.4
2-methylpentane	5.440%	42.0
2-propanol	1.320%	18.8
3,3-dimethylpentane	0.610%	37.8
dimethylcyclopentane	2.450%	45.8
dichloromethane	1.040%	6.8
cyclohexane	5.170%	29.0
acetone	4.070%	9.4
ethylbenzene	2.820%	73.0
heptane	5.170%	49.4
m-xylene	7.750%	110.8
methylcyclopentane	3.540%	48.1
hexane	14.160%	48.2
o-xylene	1.690%	105.3
toluene	14.090%	63.7
p-xylene	1.830%	101.0
methylcyclohexane	1.910%	51.0

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

54 Textile coating

Based on information from regulators - see naei99\rawdata\datafrmt\voc\species\paper_textile_film_coating.xls

Based on information from regulators - see naei99\rawdata\datafrmt\voc\species\paper_textile_film_coating.xls

Species	*% of total NMVOC*	*POCP*
2,5-dimethylhexane	0.000%	44.6
2,3-dimethylbutane	0.031%	54.1
2-ethoxyethyl acetate	1.376%	34.6
1-methyl-4-isopropylbenzene	0.015%	89.6
2-methyl-1-propanol	0.041%	36.0
2,7-dimethyloctane	0.004%	39.9
2,4-dimethyl-1-(1-methylethyl)benzene	0.003%	111.7
1-methylindan	0.001%	80.0
1-methyl-4-isopropylcyclohexane	0.015%	43.0
2-(2-hydroxy-ethoxy)ethanol	0.801%	40.1
2-methyldecane	0.015%	37.5
2-ethyl hexanol	0.029%	63.2
2,3,5-trimethylhexane	0.000%	42.6
2,4-dimethylpentane	0.097%	46.6
2,4-dimethylheptane	0.001%	42.6
2-ethoxyethanol	0.000%	38.6
2-(2-hydroxy-propoxy)-1-propanol	0.458%	55.4
2,2-dimethylpentane	0.097%	38.6
2-butoxyethanol	0.007%	48.3
2-methoxyethanol	0.121%	30.7
2,3-dimethylheptane	0.005%	42.6
2-methylheptane	0.001%	44.6
2,6-dimethyloctane	0.018%	40.2
2-methyl-5-ethyloctane	0.005%	38.0
1-methyl-3-propylbenzene	0.009%	104.1
2,5-dimethyldecane	0.002%	34.6
2,3-dimethyloctane	0.002%	40.2
2-methyl-2,4-pentanediol	0.015%	46.4
2-ethyl-1,3-dimethylbenzene	0.005%	114.6
11-methyl-1-dodecanol	0.001%	31.0
1-methyl-3-(isopropyl)benzene	0.004%	104.1
2,3,3,4-tetramethylpentane	0.000%	37.2
2,2,5-trimethylhexane	0.000%	37.6
2,3-dimethylnonane	0.004%	37.7
2-methyl-1-butylbenzene	0.000%	86.2

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Textile coating

2,5-dimethylheptane	0.002%	51.2
1-methyl-3-isopropylcyclopentane	0.000%	39.1
2-methyldecalin	0.004%	41.4
2,6-dimethylheptane	0.003%	42.3
2-butanone	14.787%	37.3
2,3-dimethylundecane	0.001%	31.7
2,2,3,3-tetramethylhexane	0.006%	19.2
1-methylindene	0.000%	136.2
1-methyl-2-isopropylbenzene	0.004%	88.4
2-butanol	0.017%	44.7
2,6-dimethyldecane	0.002%	35.1
1-methyl-2-propylbenzene	0.004%	88.4
2,3,4-trimethylhexane	0.000%	42.9
1-methyl-4-tertbutylbenzene	0.002%	87.3
1-methylbutylbenzene	0.002%	105.7
2,3-dimethylpentane	0.097%	39.1
2,5-dimethyloctane	0.006%	40.2
2,6-dimethylundecane	0.001%	31.7
3,3-dimethylpentane	0.097%	37.8
3-methylhexane	0.693%	36.4
4-ethyloctane	0.002%	44.4
4-methyl-2-pentanone	0.246%	49.0
3,7-dimethylnonane	0.005%	37.9
4,5-dimethylnonane	0.004%	37.9
3,4-dimethylheptane	0.006%	42.6
4-methyloctane	0.007%	42.3
3-ethyl-2-methylheptane	0.022%	39.9
3,3-dimethylheptane	0.001%	37.2
4,7-dimethylindan	0.000%	132.5
3-methylpentane	0.275%	47.9
2-propanol	1.902%	18.8
4-methylnonane	0.016%	40.2
6-ethyl-2-methyloctane	0.001%	38.0
3-ethyl-2-methylhexane	0.000%	43.1
4-methyl-4-hydroxy-2-pentanone	0.005%	30.7
2-methylhexane	0.693%	41.1
3,4-dimethylhexane	0.000%	45.3
4-ethyl-1,2-dimethylbenzene	0.003%	114.6
4-ethyltoluene	0.005%	90.6

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Textile coating

3,3-dimethyloctane	0.005%	35.8
5-methylundecane	0.002%	35.1
3,3,5-trimethylheptane	0.000%	36.2
6-ethyl-2-methyldecane	0.000%	32.8
3-methyloctane	0.006%	42.6
2-methylnonane	0.020%	39.9
2-methylpentane	0.305%	42.0
3,3,4-trimethylhexane	0.000%	37.6
2-methylundecane	0.002%	35.2
4-methyldecane	0.028%	37.7
2-propyl acetate	0.000%	21.1
2-phenoxy ethanol	0.001%	43.9
4,6-dimethylindan	0.000%	132.5
3-methylnonane	0.023%	40.2
2-methyloctane	0.007%	42.8
3,6-dimethyloctane	0.005%	40.5
3,5-dimethyloctane	0.002%	40.5
3-methylundecane	0.003%	35.1
4-propylheptane	0.000%	40.5
3-ethylheptane	0.005%	43.1
5-methyldecane	0.007%	37.7
3-methyldecane	0.016%	37.7
3-methylheptane	0.001%	45.0
4,4-dimethylheptane	0.000%	37.2
3-ethylhexane	0.000%	41.5
4-methylheptane	0.000%	45.0
3-ethyltoluene	0.013%	101.9
3-ethyloctane	0.004%	44.4
C11 alkanes	0.016%	36.4
C9 cycloalkanes	0.001%	41.4
C10 alkanes	0.014%	38.7
C9 alkanes	0.001%	40.4
C10 cycloalkanes	0.017%	38.4
C11 aromatic hydrocarbons	0.000%	134.2
C8 alkanes	0.000%	42.2
C12 alkanes	0.005%	35.7
C12 cycloalkanes	0.000%	35.7
C13 alkanes	0.000%	31.7
dichloromethane	5.221%	6.8

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Textile coating

dimethylformamide	3.036%	51.3
dimethylnonane	0.002%	38.4
decalin	0.005%	44.4
acetic acid	1.030%	9.7
ethylene glycol	0.034%	37.3
dimethylcyclopentane	0.390%	45.8
cyclohexane	0.739%	29.0
ethylisopropylbenzene	0.000%	105.7
dodecane	0.005%	35.7
C11 cycloalkanes	0.001%	38.4
butyl acetate	0.013%	26.9
butylbenzene	0.004%	69.0
cyclohexanol	0.001%	51.8
butyl acrylate	0.096%	47.9
decane	0.091%	38.4
diethylbenzene	0.000%	105.7
formaldehyde	0.538%	51.9
ethyldimethylbenzene	0.001%	132.0
cycloheptane	0.000%	53.4
butylcyclohexane	0.014%	42.5
ethyl acetate	0.982%	20.9
6-methylundecane	0.002%	35.1
acetone	6.784%	9.4
ethylbenzene	0.002%	73.0
ethylcyclohexane	0.005%	48.3
ethanol	1.571%	39.9
heptane	1.063%	49.4
methanol	1.355%	14.0
polyethylene glycol	0.001%	0.0
hexylcyclohexane	0.000%	36.7
pentylbenzene	0.000%	67.3
formic acid	0.059%	3.2
styrene	0.000%	14.2
isopropylbenzene	0.004%	50.0
tetramethylcyclohexane	0.003%	38.5
tetrachloroethene	0.365%	2.9
glycerol	0.096%	39.2
nonane	0.052%	41.4
tert-pentylbenzene	0.001%	67.3

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Textile coating

naphthalene	0.001%	97.7
triethanolamine	0.001%	51.3
indan	0.003%	79.7
o-xylene	0.005%	105.3
propylbenzene	0.009%	63.6
methylcyclohexane	0.304%	51.0
hexane	0.878%	48.2
isopentylbenzene	0.001%	67.3
p-xylene	0.002%	101.0
octane	0.004%	45.3
toluene	30.392%	63.7
methylethylbenzene	0.002%	94.1
methyltetralin	0.000%	114.0
undecane	0.047%	38.4
methylpropylbenzene	0.000%	105.7
methylcyclodecane	0.001%	39.3
propylcyclohexane	0.019%	45.4
tert-butylcyclopropane	0.000%	11.5
tetrahydrofuran	0.132%	57.0
propanetriol	0.002%	33.5
unspeciated	21.069%	51.3
N-methyl pyrrolidone	0.001%	51.3
trialkyl phosphate	0.001%	0.0
trichloroethene	0.057%	32.5
propylcyclopentane	0.000%	44.5
pentylcyclohexane	0.004%	39.6
m-xylene	0.002%	110.8
octahydroindan	0.003%	44.5
methylcyclopentane	0.339%	48.1
unspeciated alkanes	0.001%	36.8
unspeciated cycloalkanes	0.001%	43.4
unspeciated hydrocarbons	0.005%	71.9
1-ethyl-2,3-dimethylcyclohexane	0.002%	42.3
(1-methylpropyl)cyclohexane	0.016%	38.5
1-methyl-1-propylcyclopentane	0.002%	37.9
1,4-dimethylcyclohexane	0.004%	48.2
1,2,3,4-tetrahydronaphthalene	0.002%	115.1
1,1,3-trimethylcyclohexane	0.004%	41.2
1,3-dimethyl-4-ethylbenzene	0.004%	114.6

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Textile coating

1,1-dimethylcyclohexane	0.000%	42.8
1,2-propanediol	0.094%	44.6
1,2,3-trimethylcyclohexane	0.007%	45.4
1-ethyl-2,3-dimethylbenzene	0.003%	114.6
(2-methylbutyl)cyclohexane	0.001%	39.8
1,3-diethylbenzene	0.004%	104.1
1,1,4,4-tetramethylcyclohexane	0.003%	34.3
1,1,1-trichloroethane	0.042%	0.9
1-ethyl-2,2,6-trimethylcyclohexane	0.004%	37.2
1,2,4-trimethlycyclopentane	0.000%	43.6
1,2,4,5-tetramethylbenzene	0.002%	114.6
1,1,2-trimethylcyclohexane	0.004%	41.2
1-methyl-1-phenylcyclopropane	0.001%	63.7
1,2,4-trimethylbenzene	0.031%	127.8
1,3,5-trimethylbenzene	0.013%	138.1
1,2,4,4-tetramethylcyclopentane	0.001%	37.5
1-ethyl-1,4-dimethylcyclohexane	0.002%	38.7
1-methoxy-2-propyl acetate	0.178%	32.3
1,2,3-trimethylcyclopentane	0.000%	43.6
1,3-dimethyl-5-propylbenzene	0.000%	132.5
1,2,3,5-tetramethylcyclohexane	0.004%	42.7
(2-methylpropyl)cyclohexane	0.009%	42.7
1-ethyl-2-propylcyclohexane	0.002%	40.0
1-ethyl-4-methylcyclohexane	0.006%	45.6
1,4-diethylbenzene	0.004%	89.6
1-ethyl-3,5-dimethylbenzene	0.004%	136.0
1-ethyl-3-methylcyclohexane	0.013%	45.6
1,2-dimethylcyclohexane	0.002%	48.2
1,3-dimethylcyclohexane	0.002%	48.2
1,4-dimethyl-2-isopropylbenzene	0.001%	111.7
1,2,3,4-tetramethylbenzene	0.002%	114.6
1,2-dimethyl-3-isopropylcyclopentane	0.001%	39.3
1,2,3-trimethylbenzene	0.046%	126.7
1,3-ethylmethylcyclopentane	0.000%	44.2
(1-methylethyl)cyclohexane	0.009%	40.5
1-ethylpropylbenzene	0.001%	105.7
1,2-ethylmethylcyclopentane	0.000%	44.2
1-ethyl-2-propylbenzene	0.001%	86.2
1,2,3,5-tetramethylbenzene	0.003%	136.0

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Textile coating

1,2,4-trimethylcyclohexane	0.002%	45.4

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

55 Film coating

Based on information from regulators - see naei99\rawdata\datafrmt\voc\species\paper_textile_film_coating.xls

Based on information from regulators - see naei99\rawdata\datafrmt\voc\species\paper_textile_film_coating.xls

Species	*% of total NMVOC*	*POCP*
2-ethoxypropanol	0.490%	65.7
2,2-dimethylpentane	0.010%	38.6
2,3-dimethylpentane	0.010%	39.1
1-propanol	0.027%	56.1
2-(2-butoxyethoxy)ethanol	0.007%	50.2
2,4-dimethylpentane	0.010%	46.6
2-ethoxyethyl acetate	0.072%	34.6
2-ethoxyethanol	0.217%	38.6
2,3-dimethylbutane	0.016%	54.1
2-butanol	0.298%	44.7
2-butanone	25.948%	37.3
2-butoxyethanol	0.001%	48.3
2-methylpentane	0.163%	42.0
3,3-dimethylpentane	0.010%	37.8
3-(2-hydroxy-propoxy)-1-propanol	0.002%	56.4
3-methylpentane	0.146%	47.9
3-methylhexane	0.069%	36.4
4-methyl-2-pentanone	4.393%	49.0
2-methylhexane	0.069%	41.1
2-propanol	8.641%	18.8
4-methyl-4-hydroxy-2-pentanone	0.099%	30.7
acrylic acid	0.205%	34.4
ethyl acetate	3.881%	20.9
butyl acetate	0.588%	26.9
ethylbenzene	0.199%	73.0
ethanol	3.844%	39.9
dichloromethane	1.752%	6.8
diethylbenzene	0.004%	105.7
benzyl alcohol	0.004%	46.9
acetone	10.362%	9.4
dimethylcyclopentane	0.039%	45.8
dimethylformamide	0.282%	51.3
ethyldimethylbenzene	0.014%	132.0
diethyl ether	0.196%	44.5
cyclohexanone	1.636%	29.9

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Film coating

cyclohexane	0.096%	29.0
methanol	6.677%	14.0
unspeciated	5.677%	51.3
propyl acetate	0.012%	28.2
methylindane	0.000%	80.0
methylpropylbenzene	0.008%	105.7
p-xylene	0.129%	101.0
methyl acetate	0.002%	5.9
hexane	0.618%	48.2
formic acid	0.316%	3.2
methylethylbenzene	0.062%	94.1
propylbenzene	0.008%	63.6
heptane	0.137%	49.4
naphthalene	0.000%	97.7
tetrahydrofuryl alcohol	0.001%	58.3
tetrahydrofuran	1.139%	57.0
toluene	17.373%	63.7
indan	0.000%	79.7
methylcyclohexane	0.030%	51.0
m-xylene	0.548%	110.8
trichloroethene	1.576%	32.5
methylcyclopentane	0.087%	48.1
o-xylene	0.120%	105.3
unspeciated aromatic hydrocarbons	0.010%	95.4
1-butoxy-2-propanol	0.000%	46.3
1-butanol	0.164%	62.0
1-methoxy-2-propyl acetate	0.001%	32.3
1,2,4,5-tetramethylbenzene	0.001%	114.6
1,1,1-trichloroethane	0.004%	0.9
1,2,3,4-tetramethylbenzene	0.001%	114.6
1,4-butyrolacetone	0.002%	35.6
1,2,3,5-tetramethylbenzene	0.001%	136.0
1-methoxy-2-propanol	1.394%	35.5
1,3,5-trimethylbenzene	0.016%	138.1
1,2,3-trimethylbenzene	0.014%	126.7
1,2,4-trimethylbenzene	0.064%	127.8
1,3-dioxolane	0.003%	50.9

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

56 Printing - flexography

Based on data provided by BCF - see naei99/rawdata/datafrmt/voc/species/printing_inks.xls

Based on data provided by BCF - see naei99/rawdata/datafrmt/voc/species/printing_inks.xls

Species	*% of total NMVOC*	*POCP*
1-propanol	8.000%	56.1
2-propyl acetate	4.000%	21.1
2-propanol	5.000%	18.8
ethanol	60.000%	39.9
ethyl acetate	12.000%	20.9
propyl acetate	3.000%	28.2
1-methoxy-2-propanol	4.000%	35.5
1-ethoxy-2-propanol	4.000%	49.7

57 Printing - flexography/non-publication gravure

Based on data provided by BCF - see naei99/rawdata/datafrmt/voc/species/printing_inks.xls

Based on data provided by BCF - see naei99/rawdata/datafrmt/voc/species/printing_inks.xls

Species	*% of total NMVOC*	*POCP*
2-butanone	1.000%	37.3
1-propanol	5.000%	56.1
2,3-dimethylbutane	0.040%	54.1
2-propyl acetate	6.000%	21.1
2-methylpentane	0.400%	42.0
2-propanol	3.500%	18.8
3-methylpentane	0.360%	47.9
cyclohexane	0.060%	29.0
ethanol	55.000%	39.9
ethyl acetate	17.000%	20.9
methylcyclopentane	0.160%	48.1
hexane	0.980%	48.2
propyl acetate	5.500%	28.2
1-ethoxy-2-propanol	2.500%	49.7
1-methoxy-2-propanol	2.500%	35.5

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

58 Printing - non publication gravure

Based on data provided by BCF - see naei99/rawdata/datafrmt/voc/species/printing_inks.xls

Based on data provided by BCF - see naei99/rawdata/datafrmt/voc/species/printing_inks.xls

Species	*% of total NMVOC*	*POCP*
1-propanol	2.000%	56.1
2-butanone	2.000%	37.3
2,3-dimethylbutane	0.080%	54.1
2-methylpentane	0.800%	42.0
3-methylpentane	0.720%	47.9
2-propanol	2.000%	18.8
2-propyl acetate	8.000%	21.1
cyclohexane	0.120%	29.0
ethanol	50.000%	39.9
ethyl acetate	22.000%	20.9
methylcyclopentane	0.320%	48.1
hexane	1.960%	48.2
propyl acetate	8.000%	28.2
1-ethoxy-2-propanol	1.000%	49.7
1-methoxy-2-propanol	1.000%	35.5

59 Printing - screen printing

Based on data provided by BCF - see naei99/rawdata/datafrmt/voc/species/printing_inks.xls

Based on data provided by BCF - see naei99/rawdata/datafrmt/voc/species/printing_inks.xls

Species	*% of total NMVOC*	*POCP*
2-butoxyethanol	10.000%	48.3
ethylbenzene	5.000%	73.0
cyclohexanone	10.000%	29.9
m-xylene	13.750%	110.8
p-xylene	3.250%	101.0
o-xylene	3.000%	105.3
unspeciated	10.000%	51.3
toluene	25.000%	63.7
1-methoxy-2-propyl acetate	10.000%	32.3
1-methoxy-2-propanol	10.000%	35.5

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

60 Printing - heatset web offset

Based on data provided by BCF - see naei99/rawdata/datafrmt/voc/species/printing_inks.xls

Based on data provided by BCF - see naei99/rawdata/datafrmt/voc/species/printing_inks.xls

Species	*% of total NMVOC*	*POCP*
tetradecane	100.000	30.7

62 Solvent use - 1,1,1 trichloroethane

Single solvent

Species profile for a single solvent

Species	*% of total NMVOC*	*POCP*
1,1,1-trichloroethane	100.000	0.9

63 Solvent use - trichloroethene

Single solvent

Species profile for a single solvent

Species	*% of total NMVOC*	*POCP*
trichloroethene	100.000	32.5

64 Solvent use - tetrachloroethene

Single solvent

Species profile for a single solvent

Species	*% of total NMVOC*	*POCP*
tetrachloroethene	100.000	2.9

65 Solvent use - dichloromethane

Single solvent

Species profile for a single solvent

Species	*% of total NMVOC*	*POCP*
dichloromethane	100.000	6.8

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

66 Solvent use - white spirit

SIA analysis - see Rudd & Marlowe rpt

Species profile for a single solvent: SIA analysis - see Rudd & Marlowe rpt

Species	*% of total NMVOC*	*POCP*
2-methylheptane	0.086%	44.6
1-methylindene	0.011%	136.2
1-methyl-4-tertbutylbenzene	0.272%	87.3
1-methyl-3-(isopropyl)benzene	0.480%	104.1
2,6-dimethylundecane	0.064%	31.7
1-methyl-2-isopropylbenzene	0.408%	88.4
2,5-dimethyloctane	0.685%	40.2
1-methylbutylbenzene	0.264%	105.7
2,6-dimethyloctane	2.044%	40.2
2,3-dimethyloctane	0.171%	40.2
2,3-dimethylundecane	0.096%	31.7
2-methyldecalin	0.396%	41.4
2-methyl-5-ethyloctane	0.567%	38.0
2,4-dimethyl-1-(1-methylethyl)benzene	0.320%	111.7
1-methylindan	0.120%	80.0
2,5-dimethylhexane	0.011%	44.6
2,4-dimethylheptane	0.086%	42.6
1-methyl-3-isopropylcyclopentane	0.011%	39.1
2,3-dimethylnonane	0.407%	37.7
2-methyldecane	1.626%	37.5
2,5-dimethyldecane	0.214%	34.6
2,3-dimethylheptane	0.546%	42.6
2-methyl-1-butylbenzene	0.032%	86.2
2,6-dimethylheptane	0.278%	42.3
2,3,4-trimethylhexane	0.043%	42.9
2,6-dimethyldecane	0.267%	35.1
2,3,3,4-tetramethylpentane	0.011%	37.2
2,2,3,3-tetramethylhexane	0.642%	19.2
1-methyl-2-propylbenzene	0.480%	88.4
2-ethyl-1,3-dimethylbenzene	0.520%	114.6
1-methyl-4-isopropylcyclohexane	1.691%	43.0
2,2,5-trimethylhexane	0.043%	37.6
1-methyl-4-isopropylbenzene	1.632%	89.6
2,7-dimethyloctane	0.407%	39.9
2,3,5-trimethylhexane	0.011%	42.6

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Solvent use - white spirit

2,5-dimethylheptane	0.257%	51.2
1-methyl-3-propylbenzene	0.952%	104.1
3,7-dimethylnonane	0.567%	37.9
3-ethyltoluene	1.464%	101.9
4-propylheptane	0.032%	40.5
3,4-dimethylhexane	0.011%	45.3
3,4-dimethylheptane	0.674%	42.6
3-methylhexane	0.011%	36.4
3-ethylhexane	0.011%	41.5
4-methyloctane	0.770%	42.3
3-methyldecane	1.830%	37.7
3,3,4-trimethylhexane	0.011%	37.6
4-ethyl-1,2-dimethylbenzene	0.352%	114.6
3,6-dimethyloctane	0.503%	40.5
3-methylnonane	2.525%	40.2
4-methylnonane	1.723%	40.2
2-methyloctane	0.749%	42.8
4-methylheptane	0.032%	45.0
2-methylnonane	2.183%	39.9
5-methylundecane	0.257%	35.1
4,6-dimethylindan	0.040%	132.5
4,4-dimethylheptane	0.021%	37.2
3-ethyloctane	0.428%	44.4
4-methyldecane	3.060%	37.7
3-ethylheptane	0.546%	43.1
4-ethyloctane	0.193%	44.4
3-methylundecane	0.310%	35.1
2-methylundecane	0.267%	35.2
3,3-dimethyloctane	0.578%	35.8
6-ethyl-2-methyloctane	0.096%	38.0
3-methylheptane	0.064%	45.0
4,7-dimethylindan	0.016%	132.5
3-ethyl-2-methylheptane	2.472%	39.9
4-ethyltoluene	0.608%	90.6
3-ethyl-2-methylhexane	0.043%	43.1
4,5-dimethylnonane	0.396%	37.9
3-methyloctane	0.674%	42.6
3,3,5-trimethylheptane	0.053%	36.2
6-ethyl-2-methyldecane	0.032%	32.8

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Solvent use - white spirit

3,5-dimethyloctane	0.182%	40.5
3,3-dimethylheptane	0.064%	37.2
5-methyldecane	0.824%	37.7
ethylcyclohexane	0.578%	48.3
C9 cycloalkanes	0.107%	41.4
C13 alkanes	0.011%	31.7
C10 cycloalkanes	1.905%	38.4
dimethylnonane	0.214%	38.4
C11 cycloalkanes	0.128%	38.4
dodecane	0.610%	35.7
ethylbenzene	0.232%	73.0
C8 alkanes	0.011%	42.2
C12 cycloalkanes	0.053%	35.7
C11 alkanes	1.765%	36.4
butylcyclohexane	1.605%	42.5
cycloheptane	0.011%	53.4
C11 aromatic hydrocarbons	0.016%	134.2
C10 alkanes	1.509%	38.7
decalin	0.556%	44.4
decane	10.047%	38.4
6-methylundecane	0.203%	35.1
butylbenzene	0.416%	69.0
ethylisopropylbenzene	0.016%	105.7
C9 alkanes	0.107%	40.4
C12 alkanes	0.567%	35.7
m-xylene	0.208%	110.8
tert-butylcyclopropane	0.011%	11.5
o-xylene	0.552%	105.3
hexylcyclohexane	0.011%	36.7
indan	0.368%	79.7
isopentylbenzene	0.064%	67.3
propylcyclopentane	0.011%	44.5
isopropylbenzene	0.400%	50.0
unspeciated	0.123%	51.3
propylbenzene	0.912%	63.6
propylcyclohexane	2.086%	45.4
pentylcyclohexane	0.396%	39.6
methylcyclodecane	0.086%	39.3
pentylbenzene	0.016%	67.3

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Solvent use - white spirit

octahydroindan	0.289%	44.5
undecane	5.254%	38.4
methylcyclohexane	0.096%	51.0
methyltetralin	0.024%	114.0
octane	0.417%	45.3
p-xylene	0.192%	101.0
naphthalene	0.056%	97.7
tetramethylcyclohexane	0.310%	38.5
toluene	0.064%	63.7
tert-pentylbenzene	0.160%	67.3
heptane	0.021%	49.4
nonane	5.799%	41.4
unspeciated alkanes	0.128%	36.8
unspeciated hydrocarbons	0.535%	71.9
unspeciated cycloalkanes	0.064%	43.4
1-methyl-1-phenylcyclopropane	0.088%	63.7
1,1,2-trimethylcyclohexane	0.396%	41.2
1,1,3-trimethylcyclohexane	0.449%	41.2
(1-methylpropyl)cyclohexane	1.755%	38.5
1,2,4,5-tetramethylbenzene	0.200%	114.6
1-methyl-1-propylcyclopentane	0.246%	37.9
1,2,3,5-tetramethylbenzene	0.272%	136.0
1,2,3-trimethylcyclopentane	0.021%	43.6
1-ethyl-2,3-dimethylcyclohexane	0.225%	42.3
1,2,3,4-tetrahydronaphthalene	0.168%	115.1
1,1-dimethylcyclohexane	0.032%	42.8
1-ethyl-2-propylbenzene	0.104%	86.2
1,2,3-trimethylbenzene	1.248%	126.7
1-ethyl-3,5-dimethylbenzene	0.448%	136.0
1,2,3-trimethylcyclohexane	0.824%	45.4
1,2,3,5-tetramethylcyclohexane	0.439%	42.7
1-ethyl-2,2,6-trimethylcyclohexane	0.492%	37.2
1-ethyl-3-methylcyclohexane	1.455%	45.6
1,2,3,4-tetramethylbenzene	0.216%	114.6
(1-methylethyl)cyclohexane	0.974%	40.5
1-ethyl-4-methylcyclohexane	0.621%	45.6
1-ethylpropylbenzene	0.120%	105.7
1-ethyl-2-propylcyclohexane	0.203%	40.0
1-ethyl-1,4-dimethylcyclohexane	0.193%	38.7

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Solvent use - white spirit

1,1,4,4-tetramethylcyclohexane	0.278%	34.3
1,2,4,4-tetramethylcyclopentane	0.075%	37.5
1-ethyl-2,3-dimethylbenzene	0.328%	114.6
1,2,4-trimethylcyclohexane	0.257%	45.4
1,2-ethylmethylcyclopentane	0.032%	44.2
1,2,4-trimethylbenzene	2.880%	127.8
1,3-dimethyl-5-propylbenzene	0.048%	132.5
(2-methylpropyl)cyclohexane	0.952%	42.7
1,3-dimethyl-4-ethylbenzene	0.400%	114.6
1,2-dimethylcyclohexane	0.203%	48.2
1,3-dimethylcyclohexane	0.182%	48.2
1,3,5-trimethylbenzene	1.392%	138.1
1,2,4-trimethlycyclopentane	0.011%	43.6
1,4-dimethyl-2-isopropylbenzene	0.064%	111.7
1,4-dimethylcyclohexane	0.460%	48.2
1,4-diethylbenzene	0.408%	89.6
(2-methylbutyl)cyclohexane	0.128%	39.8
1,3-ethylmethylcyclopentane	0.021%	44.2
1,2-dimethyl-3-isopropylcyclopentane	0.150%	39.3
1,3-diethylbenzene	0.400%	104.1

67 Surface cleaning - other solvents

SIA data - see Passant & Lymberidi

SIA data - see Passant & Lymberidi, 1998

Species	*% of total NMVOC*	*POCP*
1-propanol	33.333%	56.1
2-butanone	33.333%	37.3
acetone	33.333%	9.4

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

68 Cosmetics and toiletries

Based on data from Atlantic Consulting study and US EPA species profiles - see naei99/rawdata/datafrmt/voc/species/consumer products.xls

Based on data from Atlantic Consulting study and US EPA species profiles - see naei99/rawdata/datafrmt/voc/species/consumer products.xls

Species	*% of total NMVOC*	*POCP*
1-methyl-4-isopropylcyclohexane	0.023%	43.0
2-methylheptane	0.001%	44.6
1-methyl-4-tertbutylbenzene	0.004%	87.3
2-methyldecane	0.022%	37.5
2,2,5-trimethylhexane	0.001%	37.6
1-methylindan	0.002%	80.0
1-methyl-4-isopropylbenzene	0.023%	89.6
1-methyl-2-propylbenzene	0.007%	88.4
1-methyl-3-(isopropyl)benzene	0.007%	104.1
2,2,3,3-tetramethylhexane	0.009%	19.2
2-methyldecalin	0.005%	41.4
1-methyl-3-isopropylcyclopentane	0.000%	39.1
1-methylindene	0.000%	136.2
1-methyl-2-isopropylbenzene	0.006%	88.4
1-methylbutylbenzene	0.004%	105.7
1-methyl-3-propylbenzene	0.013%	104.1
2,5-dimethyldecane	0.003%	34.6
2,3,4-trimethylhexane	0.001%	42.9
2,6-dimethyldecane	0.004%	35.1
2,7-dimethyloctane	0.006%	39.9
2,3,5-trimethylhexane	0.000%	42.6
2,6-dimethyloctane	0.028%	40.2
2,3-dimethyloctane	0.002%	40.2
2,3-dimethylundecane	0.001%	31.7
2-ethyl-1,3-dimethylbenzene	0.007%	114.6
2,6-dimethylheptane	0.004%	42.3
2,3-dimethylnonane	0.006%	37.7
2-aminoethanol	0.000%	51.3
2-butanone	0.000%	37.3
2,3-dimethylheptane	0.008%	42.6
2-butoxyethanol	0.002%	48.3
2-methyl-1-butylbenzene	0.000%	86.2
2,6-dimethylundecane	0.001%	31.7
2,3,3,4-tetramethylpentane	0.000%	37.2

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Cosmetics and toiletries

2,5-dimethyloctane	0.009%	40.2
2,4-dimethyl-1-(1-methylethyl)benzene	0.004%	111.7
2,4-dimethylheptane	0.001%	42.6
2,5-dimethylheptane	0.004%	51.2
2-methyl-5-ethyloctane	0.008%	38.0
2,5-dimethylhexane	0.000%	44.6
3,3-dimethylheptane	0.001%	37.2
3-methylheptane	0.001%	45.0
4-methylnonane	0.024%	40.2
5-methylundecane	0.004%	35.1
2-methylpropane	2.980%	30.7
3-methyloctane	0.009%	42.6
4,7-dimethylindan	0.000%	132.5
3,3-dimethyloctane	0.008%	35.8
3-ethyloctane	0.006%	44.4
3-methyldecane	0.025%	37.7
3,3,5-trimethylheptane	0.001%	36.2
4-ethyltoluene	0.008%	90.6
3-ethyltoluene	0.020%	101.9
3,4-dimethylheptane	0.009%	42.6
3-methylhexane	0.000%	36.4
3,4-dimethylhexane	0.000%	45.3
3,5-dimethyloctane	0.003%	40.5
3-methylnonane	0.035%	40.2
4,6-dimethylindan	0.001%	132.5
2-methylundecane	0.004%	35.2
4-ethyl-1,2-dimethylbenzene	0.005%	114.6
3-methylundecane	0.004%	35.1
2-methyloctane	0.010%	42.8
6-ethyl-2-methyldecane	0.000%	32.8
3-ethyl-2-methylhexane	0.001%	43.1
4,5-dimethylnonane	0.005%	37.9
5-methyldecane	0.011%	37.7
2-propanol	0.126%	18.8
3,7-dimethylnonane	0.008%	37.9
4-methylheptane	0.000%	45.0
4-propylheptane	0.000%	40.5
2-methylnonane	0.030%	39.9
3-ethylheptane	0.008%	43.1

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Cosmetics and toiletries

3-ethyl-2-methylheptane	0.034%	39.9
3-ethylhexane	0.000%	41.5
4-methyldecane	0.042%	37.7
4-ethyloctane	0.003%	44.4
3,6-dimethyloctane	0.007%	40.5
4-methyloctane	0.011%	42.3
4,4-dimethylheptane	0.000%	37.2
3,3,4-trimethylhexane	0.000%	37.6
6-ethyl-2-methyloctane	0.001%	38.0
ethylcyclohexane	0.008%	48.3
decane	0.139%	38.4
C7 cycloalkanes	0.047%	51.0
C10 alkanes	0.021%	38.7
C11 aromatic hydrocarbons	0.000%	134.2
dihydroxyacetone	0.004%	28.5
C12 cycloalkanes	0.001%	35.7
C12 alkanes	0.008%	35.7
butyl acetate	0.114%	26.9
C11 alkanes	0.024%	36.4
ethanol	84.865%	39.9
butane	0.037%	35.2
cycloheptane	0.000%	53.4
6-methylundecane	0.003%	35.1
acetone	4.130%	9.4
benzyl alcohol	0.000%	46.9
butylcyclohexane	0.022%	42.5
C11 cycloalkanes	0.002%	38.4
dimethyl ether	0.008%	18.9
C10 cycloalkanes	0.026%	38.4
ethylisopropylbenzene	0.000%	105.7
C9 cycloalkanes	0.001%	41.4
decalin	0.008%	44.4
ethyl acetate	0.703%	20.9
C8 alkanes	0.000%	42.2
C13 alkanes	0.000%	31.7
C9 alkanes	0.001%	40.4
dimethylnonane	0.003%	38.4
ethylbenzene	0.003%	73.0
butylbenzene	0.006%	69.0

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Cosmetics and toiletries

dodecane	0.008%	35.7
methylcyclodecane	0.001%	39.3
propylcyclohexane	0.029%	45.4
octane	0.006%	45.3
m-xylene	0.003%	110.8
tetramethylcyclohexane	0.004%	38.5
propylbenzene	0.013%	63.6
p-xylene	0.003%	101.0
isopropylbenzene	0.006%	50.0
propane	0.090%	17.6
propylcyclopentane	0.000%	44.5
pentylbenzene	0.000%	67.3
naphthalene	0.001%	97.7
heptane	0.002%	49.4
octahydroindan	0.004%	44.5
undecane	0.073%	38.4
methyltetralin	0.000%	114.0
toluene	0.449%	63.7
methylcyclohexane	0.001%	51.0
pentylcyclohexane	0.005%	39.6
isopentylbenzene	0.001%	67.3
unspeciated	5.050%	51.3
tert-butylcyclopropane	0.000%	11.5
tert-pentylbenzene	0.002%	67.3
hexylcyclohexane	0.000%	36.7
indan	0.005%	79.7
o-xylene	0.008%	105.3
nonane	0.080%	41.4
unspeciated aliphatic hydrocarbons	0.001%	36.8
unspeciated hydrocarbons	0.007%	71.9
unspeciated aromatic hydrocarbons	0.008%	95.4
unspeciated alkanes	0.002%	36.8
unspeciated cycloalkanes	0.001%	43.4
1,2,3-trimethylcyclohexane	0.011%	45.4
1-ethyl-4-methylcyclohexane	0.009%	45.6
1-ethyl-1,4-dimethylcyclohexane	0.003%	38.7
1-ethyl-3,5-dimethylbenzene	0.006%	136.0
1,3-dimethyl-5-propylbenzene	0.001%	132.5
1,2,3,4-tetramethylbenzene	0.003%	114.6

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Cosmetics and toiletries

1,3-ethylmethylcyclopentane	0.000%	44.2
1,4-diethylbenzene	0.006%	89.6
1-ethyl-2-propylcyclohexane	0.003%	40.0
1,2-dimethylcyclohexane	0.003%	48.2
1,2,3,5-tetramethylcyclohexane	0.006%	42.7
1-ethyl-2,2,6-trimethylcyclohexane	0.007%	37.2
1-ethyl-3-methylcyclohexane	0.020%	45.6
1,2-ethylmethylcyclopentane	0.000%	44.2
(2-methylpropyl)cyclohexane	0.013%	42.7
1,3-dimethylcyclohexane	0.003%	48.2
1,2,3-trimethylcyclopentane	0.000%	43.6
1,2-dimethyl-3-isopropylcyclopentane	0.002%	39.3
1,2,3,5-tetramethylbenzene	0.004%	136.0
1-ethyl-2,3-dimethylbenzene	0.005%	114.6
(1-methylethyl)cyclohexane	0.014%	40.5
1-methyl-1-propylcyclopentane	0.003%	37.9
1-methyl-1-phenylcyclopropane	0.001%	63.7
1,4-dimethyl-2-isopropylbenzene	0.001%	111.7
1,2,4,5-tetramethylbenzene	0.003%	114.6
1,3,5-trimethylbenzene	0.019%	138.1
1,2,4-trimethlycyclopentane	0.000%	43.6
1,1,3-trimethylcyclohexane	0.006%	41.2
1,1,4,4-tetramethylcyclohexane	0.004%	34.3
(2-methylbutyl)cyclohexane	0.002%	39.8
1-ethylpropylbenzene	0.002%	105.7
1,4-dimethylcyclohexane	0.006%	48.2
1,2,4-trimethylcyclohexane	0.004%	45.4
1,3-diethylbenzene	0.006%	104.1
1,2-propanediol	0.002%	44.6
1,1-dimethylcyclohexane	0.000%	42.8
1-ethyl-2-propylbenzene	0.001%	86.2
1-ethyl-2,3-dimethylcyclohexane	0.003%	42.3
1-butanol	0.000%	62.0
1,3-dimethyl-4-ethylbenzene	0.006%	114.6
1,2,3,4-tetrahydronaphthalene	0.002%	115.1
1,2,4-trimethylbenzene	0.040%	127.8
1,1,2-trimethylcyclohexane	0.005%	41.2
1,2,4,4-tetramethylcyclopentane	0.001%	37.5
(1-methylpropyl)cyclohexane	0.024%	38.5

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Cosmetics and toiletries

1,2,3-trimethylbenzene	0.017%	126.7

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

69 Household products

Based on data from Atlantic Consulting study and US EPA species profiles - see naei99/rawdata/datafrmt/voc/species/consumer products.xls

Based on data from Atlantic Consulting study and US EPA species profiles - see naei99/rawdata/datafrmt/voc/species/consumer products.xls

Species	*% of total NMVOC*	*POCP*
2-(2-butoxyethoxy)ethanol	0.008%	50.2
2-(2-hydroxy-ethoxy)ethanol	0.108%	40.1
2-(methoxyethoxy)ethanol	0.386%	42.8
2,3-dimethylnonane	0.034%	37.7
2-methyl-5-ethyloctane	0.048%	38.0
2,7-dimethyloctane	0.034%	39.9
2-aminoethanol	0.104%	51.3
1-methyl-3-isopropylcyclopentane	0.001%	39.1
1-propanol	0.002%	56.1
2,3-dimethylheptane	0.046%	42.6
1-methylbutylbenzene	0.022%	105.7
2,3-dimethyloctane	0.014%	40.2
2-butanone	0.006%	37.3
2,5-dimethyldecane	0.018%	34.6
2,5-dimethylheptane	0.021%	51.2
2,5-dimethylhexane	0.001%	44.6
2,5-dimethyloctane	0.057%	40.2
2,3-dimethylundecane	0.008%	31.7
2-methyldecane	0.136%	37.5
1-methyl-4-isopropylcyclohexane	0.142%	43.0
1-methylindan	0.010%	80.0
2,4-dimethyl-1-(1-methylethyl)benzene	0.027%	111.7
1-methyl-4-tertbutylbenzene	0.023%	87.3
1-methylindene	0.001%	136.2
1-methyl-3-propylbenzene	0.080%	104.1
1-methyl-3-(isopropyl)benzene	0.040%	104.1
2,6-dimethyloctane	0.171%	40.2
1-methyl-4-isopropylbenzene	0.137%	89.6
2,4-dimethylheptane	0.007%	42.6
2,6-dimethylundecane	0.005%	31.7
2,6-dimethylheptane	0.023%	42.3
2,6-dimethyldecane	0.022%	35.1
2,3,4-trimethylhexane	0.004%	42.9
2-butoxyethyl acetate	0.001%	35.1

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Household products

2,3,3,4-tetramethylpentane	0.001%	37.2
2-ethoxyethanol	0.002%	38.6
2-methyldecalin	0.033%	41.4
2,2,3,3-tetramethylhexane	0.054%	19.2
2,2,5-trimethylhexane	0.004%	37.6
1-methyl-2-propylbenzene	0.040%	88.4
2,3,5-trimethylhexane	0.001%	42.6
1-methyl-2-isopropylbenzene	0.034%	88.4
2-butoxyethanol	4.000%	48.3
2,3-dimethylbutane	0.000%	54.1
2-ethyl-1,3-dimethylbenzene	0.044%	114.6
2-methoxyethanol	0.004%	30.7
2-methyl-1-butylbenzene	0.003%	86.2
2-methylheptane	0.007%	44.6
4-methylheptane	0.003%	45.0
3,3,5-trimethylheptane	0.004%	36.2
3-ethyl-2-methylhexane	0.004%	43.1
4,5-dimethylnonane	0.033%	37.9
3,4-dimethylheptane	0.056%	42.6
3-methylheptane	0.005%	45.0
3-methyloctane	0.056%	42.6
5-methyl-2-hexanone	0.000%	51.6
3,3-dimethyloctane	0.048%	35.8
4-ethyloctane	0.016%	44.4
3,3,4-trimethylhexane	0.001%	37.6
2-methylpropane	4.092%	30.7
3-methylundecane	0.026%	35.1
4,6-dimethylindan	0.003%	132.5
3-ethylheptane	0.046%	43.1
2-methylpentane	0.004%	42.0
3-ethyl-2-methylheptane	0.207%	39.9
4-methyldecane	0.256%	37.7
4,7-dimethylindan	0.001%	132.5
3-ethyloctane	0.036%	44.4
4-methyloctane	0.065%	42.3
5-methyldecane	0.069%	37.7
4-methyl-4-hydroxy-2-pentanone	0.001%	30.7
3,5-dimethyloctane	0.015%	40.5
3,3-dimethylheptane	0.005%	37.2

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Household products

2-methyloctane	0.063%	42.8
3-ethylhexane	0.001%	41.5
3-methylpentane	0.003%	47.9
3-methylnonane	0.212%	40.2
4-propylheptane	0.003%	40.5
4-methylnonane	0.144%	40.2
5-methylundecane	0.021%	35.1
4-methyl-2-pentanone	0.012%	49.0
2-methylnonane	0.183%	39.9
3,6-dimethyloctane	0.042%	40.5
4-ethyl-1,2-dimethylbenzene	0.030%	114.6
3,4-dimethylhexane	0.001%	45.3
3,7-dimethylnonane	0.048%	37.9
4,4-dimethylheptane	0.002%	37.2
3-methyldecane	0.153%	37.7
4-ethyltoluene	0.051%	90.6
3-methylhexane	0.001%	36.4
2-methylundecane	0.022%	35.2
6-ethyl-2-methyldecane	0.003%	32.8
3-ethyltoluene	0.123%	101.9
6-ethyl-2-methyloctane	0.008%	38.0
2-propanol	6.210%	18.8
C13 alkanes	0.001%	31.7
formaldehyde	0.054%	51.9
decane	0.842%	38.4
ethanol	28.067%	39.9
C12 cycloalkanes	0.004%	35.7
decalin	0.047%	44.4
butylcyclohexane	0.134%	42.5
ethylcyclohexane	0.048%	48.3
ethylisopropylbenzene	0.001%	105.7
ethylbenzene	0.056%	73.0
C11 alkanes	0.148%	36.4
C10 cycloalkanes	0.160%	38.4
dimethyl ether	0.003%	18.9
ethyl acetate	0.097%	20.9
ethylene glycol	2.730%	37.3
C9 cycloalkanes	0.009%	41.4
dimethylcyclopentane	0.002%	45.8

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Household products

butane	0.242%	35.2
cyclohexane	0.004%	29.0
butylbenzene	0.035%	69.0
cycloheptane	0.001%	53.4
C9 alkanes	0.009%	40.4
acetone	1.370%	9.4
ethylene oxide	1.320%	2.4
C10 alkanes	0.126%	38.7
C8 alkanes	0.001%	42.2
dodecane	0.051%	35.7
acetic acid	0.059%	9.7
C11 aromatic hydrocarbons	0.001%	134.2
C12 alkanes	0.048%	35.7
dimethylpentane	0.002%	49.4
C11 cycloalkanes	0.011%	38.4
6-methylundecane	0.017%	35.1
dimethylnonane	0.018%	38.4
pentylcyclohexane	0.033%	39.6
hexylcyclohexane	0.001%	36.7
hexachloroethane	0.001%	0.0
pentylbenzene	0.001%	67.3
methylcyclopentane	0.003%	48.1
nitropropane	0.004%	0.0
methylcyclodecane	0.007%	39.3
naphthalene	0.005%	97.7
o-xylene	0.067%	105.3
undecane	0.440%	38.4
tert-pentylbenzene	0.013%	67.3
methyltetralin	0.002%	114.0
tert-butylcyclopropane	0.001%	11.5
hexane	0.072%	48.2
octahydroindan	0.024%	44.5
heptane	0.057%	49.4
methylcyclohexane	0.009%	51.0
tetrachloroethene	0.316%	2.9
propylcyclohexane	0.175%	45.4
octane	0.035%	45.3
m-xylene	0.112%	110.8
isopentylbenzene	0.005%	67.3

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Household products

isopropylbenzene	0.034%	50.0
limonene	0.039%	74.5
propylbenzene	0.076%	63.6
pine oil	4.210%	74.5
naphthol	0.059%	61.1
methanol	0.089%	14.0
nonane	0.486%	41.4
tetramethylcyclohexane	0.026%	38.5
toluene	0.023%	63.7
indan	0.031%	79.7
trichloroethene	0.001%	32.5
p-xylene	0.038%	101.0
methylhexane	0.006%	38.8
propane	2.960%	17.6
propylcyclopentane	0.001%	44.5
unspeciated alkanes	0.011%	36.8
unspeciated cycloalkanes	0.005%	43.4
unspeciated aromatic hydrocarbons	2.560%	95.4
unspeciated hydrocarbons	0.254%	71.9
unspeciated aliphatic hydrocarbons	0.734%	36.8
1,4-dimethyl-2-isopropylbenzene	0.005%	111.7
1,2,3,5-tetramethylcyclohexane	0.037%	42.7
1-ethyl-2-propylbenzene	0.009%	86.2
1-ethyl-2-propylcyclohexane	0.017%	40.0
1,2,4-trimethylcyclohexane	0.021%	45.4
1,4-diethylbenzene	0.034%	89.6
1,2-dichlorobenzene	0.050%	12.0
1,2,3-trimethylbenzene	0.105%	126.7
1,2,3,4-tetrahydronaphthalene	0.014%	115.1
1-methyl-1-propylcyclopentane	0.021%	37.9
(2-methylbutyl)cyclohexane	0.011%	39.8
1-methyl-1-phenylcyclopropane	0.007%	63.7
1,1,3-trimethylcyclohexane	0.038%	41.2
1-methoxy-2-propyl acetate	0.001%	32.3
1,3,5-trimethylbenzene	0.117%	138.1
1,1,4,4-tetramethylcyclohexane	0.023%	34.3
1-methoxy-2-propanol	0.027%	35.5
1,3-diethylbenzene	0.034%	104.1
1,1,2-trimethylcyclohexane	0.033%	41.2

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Household products

1,2-propanediol	0.018%	44.6
1,2-dimethylcyclohexane	0.017%	48.2
1-ethylpropylbenzene	0.010%	105.7
1,4-dichlorobenzene	8.400%	5.0
1,2-ethylmethylcyclopentane	0.003%	44.2
1,3-dimethyl-4-ethylbenzene	0.034%	114.6
1-ethyl-4-methylcyclohexane	0.052%	45.6
1,3-dimethyl-5-propylbenzene	0.004%	132.5
1,2,3,4-tetramethylbenzene	0.018%	114.6
1-ethyl-3-methylcyclohexane	0.122%	45.6
1,3-dimethylcyclohexane	0.015%	48.2
1,2,3,5-tetramethylbenzene	0.023%	136.0
1,2-dimethyl-3-isopropylcyclopentane	0.013%	39.3
1-ethyl-3,5-dimethylbenzene	0.038%	136.0
1,3-ethylmethylcyclopentane	0.002%	44.2
1,1-dimethylcyclohexane	0.003%	42.8
1,4-dimethylcyclohexane	0.039%	48.2
1,2,3-trimethylcyclopentane	0.002%	43.6
1-ethyl-2,3-dimethylbenzene	0.028%	114.6
1,2,4-trimethlycyclopentane	0.001%	43.6
1,2,3-trimethylcyclohexane	0.069%	45.4
1,2,4,4-tetramethylcyclopentane	0.006%	37.5
1-butoxy-2-propanol	0.002%	46.3
1-(2-methoxy-1-methyl-ethoxy)-2-propanol	0.003%	53.5
1,2,4-trimethylbenzene	0.241%	127.8
(1-methylethyl)cyclohexane	0.082%	40.5
(2-methylpropyl)cyclohexane	0.080%	42.7
1-ethyl-2,2,6-trimethylcyclohexane	0.041%	37.2
1-ethyl-2,3-dimethylcyclohexane	0.019%	42.3
1,2,4,5-tetramethylbenzene	0.017%	114.6
1-(butoxyethoxy)-2-propanol	0.001%	55.5
(1-methylpropyl)cyclohexane	0.147%	38.5
1-ethyl-1,4-dimethylcyclohexane	0.016%	38.7
1-(2-ethoxy-1-methyl-ethoxy)-2-propanol	0.001%	56.4

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

70 Petrol distribution - leaded

From petrol distribution report

Speciation for 4 star and unleaded petrols from Chris Dore (spreadsheet - petabat1.xls): From petrol distribution report

Species	*% of total NMVOC*	*POCP*
2-methylbutane	15.899%	40.5
2-methyl-2-butene	0.430%	84.2
1-pentene	0.637%	97.7
2,3-dimethylbutane	0.094%	54.1
2-methyl-1-butene	0.273%	77.1
2,2-dimethylbutane	0.072%	24.1
2,2-dimethylpropane	0.003%	17.3
2-methylhexane	0.051%	41.1
2-methylpentane	1.452%	42.0
3-methylpentane	0.863%	47.9
2-pentene	1.450%	111.9
2-methylpropane	22.016%	30.7
3-methylhexane	0.051%	36.4
3-methyl-1-butene	0.348%	67.1
ethylbenzene	0.102%	73.0
benzene	0.389%	21.8
C8 alkanes	1.089%	42.2
C7 alkanes	0.912%	42.3
ethane	0.253%	12.3
butane	37.908%	35.2
ethylene	0.449%	100.0
C6 alkenes	0.518%	95.7
acetylene	0.573%	8.5
cis-2-pentene	0.566%	112.1
cyclopentane	0.266%	51.5
cis-2-butene	1.350%	114.6
toluene	0.609%	63.7
pentane	2.768%	39.5
trans-2-pentene	1.017%	111.7
heptane	0.072%	49.4
propane	1.936%	17.6
m-xylene	0.221%	110.8
trans-2-butene	1.463%	113.2
hexane	0.932%	48.2
methylpropene	1.126%	62.7

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Petrol distribution - leaded

propylene	0.247%	112.3
isoprene	0.075%	109.2
unspeciated	0.058%	51.3
o-xylene	0.068%	105.3
1-butene	1.229%	107.9
1,3-butadiene	0.162%	85.1

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

71 Petrol distribution - unleaded

From petrol distribution report

Speciation for 4 star and unleaded petrols from Chris Dore (spreadsheet - petabat1.xls): From petrol distribution report

Species	*% of total NMVOC*	*POCP*
2,2-dimethylbutane	0.074%	24.1
1-pentene	0.567%	97.7
2-methyl-2-butene	0.383%	84.2
2-methylbutane	17.260%	40.5
2,2-dimethylpropane	0.000%	17.3
2,3-dimethylbutane	0.097%	54.1
2-methyl-1-butene	0.243%	77.1
2-methylpentane	1.813%	42.0
3-methylhexane	0.045%	36.4
2-pentene	1.291%	111.9
3-methyl-1-butene	0.310%	67.1
3-methylpentane	0.752%	47.9
2-methylpropane	20.657%	30.7
2-methylhexane	0.045%	41.1
butane	44.739%	35.2
benzene	0.537%	21.8
C8 alkanes	0.459%	42.2
cis-2-butene	0.737%	114.6
cyclopentane	0.129%	51.5
ethane	0.078%	12.3
ethylene	0.040%	100.0
ethylbenzene	0.048%	73.0
C7 alkanes	0.587%	42.3
cis-2-pentene	0.494%	112.1
C6 alkenes	0.552%	95.7
acetylene	0.030%	8.5
trans-2-butene	0.805%	113.2
m-xylene	0.127%	110.8
propylene	0.038%	112.3
trans-2-pentene	0.935%	111.7
isoprene	0.037%	109.2
propane	1.216%	17.6
o-xylene	0.042%	105.3
pentane	2.540%	39.5
hexane	0.923%	48.2

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Petrol distribution - unleaded

unspeciated	0.001%	51.3
heptane	0.015%	49.4
toluene	0.419%	63.7
methylpropene	0.489%	62.7
1-butene	0.434%	107.9
1,3-butadiene	0.013%	85.1

73 Printing - publication gravure

Based on data provided by BCF - see naei99/rawdata/datafrmt/voc/species/printing_inks.xls

Based on data provided by BCF - see naei99/rawdata/datafrmt/voc/species/printing_inks.xls

Species	*% of total NMVOC*	*POCP*
2,3-dimethylbutane	0.800%	54.1
2-methylpentane	8.000%	42.0
3-methylpentane	7.200%	47.9
cyclohexane	1.200%	29.0
methylcyclopentane	3.200%	48.1
hexane	19.600%	48.2
toluene	60.000%	63.7

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

74 Petroleum processes

Based on PI data - see naei99/rawdata/datafrmt/voc/petroleum99.xls

Based on PI data - see naei99/rawdata/datafrmt/voc/petroleum99.xls

Species	*% of total NMVOC*	*POCP*
2,3-dimethylbutane	0.089%	54.1
2,2-dimethylbutane	0.068%	24.1
2-ethyltoluene	0.000%	89.8
4-ethyltoluene	0.000%	90.6
3-ethyltoluene	0.000%	101.9
2-methylpentane	0.303%	42.0
3-methylpentane	0.205%	47.9
ethylbenzene	1.095%	73.0
ethylene	2.538%	100.0
butane	1.265%	35.2
ethanethiol	0.000%	0.0
benzene	9.950%	21.8
C7 alkanes	2.242%	42.3
cyclohexane	2.666%	29.0
dichloromethane	1.528%	6.8
ethane	0.668%	12.3
pentane	8.353%	39.5
p-xylene	0.390%	101.0
m-xylene	1.650%	110.8
unspeciated	58.126%	51.3
octane	0.498%	45.3
propylene	0.470%	112.3
hexane	0.642%	48.2
toluene	2.871%	63.7
isopropylbenzene	0.184%	50.0
o-xylene	0.360%	105.3
nonane	0.211%	41.4
propane	0.112%	17.6
unspeciated hydrocarbons	3.078%	71.9
1,2-dichloroethane	0.438%	7.0
1,2,3-trimethylbenzene	0.001%	126.7
1,3,5-trimethylbenzene	0.001%	138.1
1,2,4-trimethylbenzene	0.001%	127.8

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

75 Aircraft landing/takeoff (LTO) - commercial

US EPA profile number 1098

USEPA profile number 1098

Species	*% of total NMVOC*	*POCP*
1-propanal	1.051%	79.8
1-pentene	1.093%	97.7
2-methyl-2-butene	0.332%	84.2
1-octene	0.310%	78.2
2-methyl-1-butene	0.070%	77.1
1-nonene	0.265%	95.6
3-methyl-1-butene	0.090%	67.1
2-pentene	0.373%	111.9
2-methylpentane	0.431%	42.0
acetone	2.710%	9.4
benzaldehyde	0.608%	-9.2
ethylene	19.279%	100.0
benzene	2.146%	21.8
acetylene	4.612%	8.5
C12 alkanes	0.199%	35.7
ethane	0.973%	12.3
acetaldehyde	5.143%	64.1
decane	0.465%	38.4
butylbenzene	0.265%	69.0
crotonaldehyde	0.000%	70.0
formaldehyde	16.602%	51.9
cis-2-butene	0.531%	114.6
dodecane	1.183%	35.7
C14 alkanes	0.210%	30.7
ethylbenzene	0.188%	73.0
C16 alkanes	0.155%	24.2
C15 alkanes	0.188%	28.4
acrolein	2.511%	73.0
tetradecane	0.642%	30.7
pentane	0.232%	39.5
styrene	0.431%	14.2
pentadecane	0.288%	28.4
glyoxal	2.809%	58.0
nonane	0.144%	41.4
hexamethylcyclotrisiloxane	10.076%	0.0
m-xylene	0.181%	110.8

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Aircraft landing/takeoff (LTO) - commercial

hexadecane	0.133%	26.0
naphthalene	0.630%	97.7
octamethylcyclotetrasiloxane	3.230%	0.0
propane	0.199%	17.6
octane	0.055%	45.3
toluene	0.575%	63.7
o-xylene	0.210%	105.3
phenol	0.265%	63.3
methyl glyoxal	2.179%	72.0
methyl naphthalenes	0.542%	125.2
heptane	0.066%	49.4
tridecane	0.730%	32.7
pentylbenzene	0.210%	67.3
undecane	0.586%	38.4
heptadecane	0.011%	12.2
propylene	5.696%	112.3
p-xylene	0.140%	101.0
unspeciated alkanes	0.332%	36.8
1-decene	0.188%	91.7
1-butanal	1.327%	79.5
1-hexanal	0.232%	100.0
1-heptene	0.597%	83.1
1-butene	2.179%	107.9
1-hexene	0.907%	87.4
1,3-butadiene	1.991%	85.1

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

76 Aircraft landing/takeoff (LTO) - general aviation

US EPA profile number 1099

USEPA profile number 1099

Species	*% of total NMVOC*	*POCP*
1-octene	0.281%	78.2
1-pentene	0.988%	97.7
1-nonene	0.247%	95.6
2-methyl-1-butene	0.063%	77.1
1-propanal	1.011%	79.8
2-methyl-2-butene	0.301%	84.2
2-methylpentane	0.393%	42.0
3-methyl-1-butene	0.080%	67.1
2-pentene	0.332%	111.9
ethane	1.033%	12.3
acrolein	2.314%	73.0
ethylene	17.387%	100.0
dodecane	1.359%	35.7
ethylbenzene	0.168%	73.0
crotonaldehyde	0.000%	70.0
C16 alkanes	0.146%	24.2
C14 alkanes	0.191%	30.7
C12 alkanes	0.180%	35.7
butylbenzene	0.247%	69.0
acetaldehyde	4.852%	64.1
C15 alkanes	0.168%	28.4
decane	0.472%	38.4
acetylene	4.145%	8.5
acetone	3.291%	9.4
benzene	2.011%	21.8
benzaldehyde	0.595%	-9.2
formaldehyde	15.882%	51.9
cis-2-butene	0.505%	114.6
undecane	0.584%	38.4
propylene	5.156%	112.3
heptadecane	0.011%	12.2
pentadecane	0.303%	28.4
glyoxal	2.842%	58.0
octane	0.045%	45.3
styrene	0.416%	14.2
tridecane	0.741%	32.7

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Aircraft landing/takeoff (LTO) - general aviation

naphthalene	0.573%	97.7
o-xylene	0.202%	105.3
hexadecane	0.157%	26.0
p-xylene	0.127%	101.0
methyl glyoxal	2.033%	72.0
octamethylcyclotetrasiloxane	4.718%	0.0
phenol	0.247%	63.3
heptane	0.067%	49.4
m-xylene	0.165%	110.8
methyl naphthalenes	0.494%	125.2
hexamethylcyclotrisiloxane	13.220%	0.0
propane	0.225%	17.6
pentane	0.213%	39.5
pentylbenzene	0.191%	67.3
toluene	0.550%	63.7
nonane	0.168%	41.4
tetradecane	0.663%	30.7
unspeciated alkanes	0.303%	36.8
1-butanal	1.337%	79.5
1-heptene	0.584%	83.1
1-hexanal	0.225%	100.0
1-decene	0.168%	91.7
1-hexene	0.854%	87.4
1-butene	2.011%	107.9
1,3-butadiene	1.763%	85.1

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

77 Aircraft landing/takeoff (LTO) - military

US EPA profile number 1097

USEPA profile number 1097

Species	*% of total NMVOC*	*POCP*
2-methyl-2-butene	0.347%	84.2
1-octene	0.331%	78.2
1-nonene	0.287%	95.6
1-pentene	1.153%	97.7
1-propanal	1.082%	79.8
2-methyl-1-butene	0.073%	77.1
3-methyl-1-butene	0.093%	67.1
2-pentene	0.388%	111.9
2-methylpentane	0.453%	42.0
C12 alkanes	0.210%	35.7
acrolein	2.628%	73.0
butylbenzene	0.287%	69.0
ethylene	20.280%	100.0
C15 alkanes	0.199%	28.4
acetaldehyde	5.332%	64.1
C14 alkanes	0.221%	30.7
C16 alkanes	0.177%	24.2
decane	0.486%	38.4
acetylene	4.869%	8.5
acetone	2.661%	9.4
dodecane	1.181%	35.7
ethane	1.005%	12.3
benzaldehyde	0.629%	-9.2
benzene	2.230%	21.8
ethylbenzene	0.199%	73.0
crotonaldehyde	0.000%	70.0
cis-2-butene	0.552%	114.6
formaldehyde	17.090%	51.9
phenol	0.287%	63.3
propylene	6.006%	112.3
propane	0.210%	17.6
pentylbenzene	0.232%	67.3
undecane	0.596%	38.4
tridecane	0.740%	32.7
methyl naphthalenes	0.574%	125.2
m-xylene	0.187%	110.8

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Aircraft landing/takeoff (LTO) - military

octane	0.055%	45.3
o-xylene	0.221%	105.3
methyl glyoxal	2.274%	72.0
glyoxal	2.407%	58.0
heptadecane	0.011%	12.2
pentadecane	0.287%	28.4
hexamethylcyclotrisiloxane	7.684%	0.0
hexadecane	0.132%	26.0
heptane	0.077%	49.4
tetradecane	0.651%	30.7
naphthalene	0.662%	97.7
nonane	0.144%	41.4
p-xylene	0.144%	101.0
octamethylcyclotetrasiloxane	2.616%	0.0
styrene	0.453%	14.2
pentane	0.243%	39.5
toluene	0.607%	63.7
unspeciated alkanes	0.353%	36.8
1-heptene	0.596%	83.1
1-butene	2.274%	107.9
1-hexanal	0.243%	100.0
1-butanal	1.369%	79.5
1-hexene	0.949%	87.4
1,3-butadiene	2.087%	85.1
1-decene	0.188%	91.7

83 By product coke oven stack gas

US EPA profile number 0011

US EPA profile number 0011

Species	*% of total NMVOC*	*POCP*
ethylene	50.640%	100.0
acetylene	2.194%	8.5
benzene	25.777%	21.8
ethane	14.625%	12.3
toluene	1.280%	63.7
propane	0.914%	17.6
propylene	3.473%	112.3
1,3-butadiene	0.914%	85.1
1-butene	0.183%	107.9

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

86 Coke oven blast furnace gas

US EPA profile number 0217

US EPA profile number 0217

Species	*% of total NMVOC*	*POCP*
ethylene	4.738%	100.0
benzene	72.758%	21.8
ethane	2.369%	12.3
propylene	9.306%	112.3
1-butene	10.829%	107.9

87 External combustion boiler - coal slurry

US EPA profile number 1085

US EPA profile number 1085

Species	*% of total NMVOC*	*POCP*
ethane	48.331%	12.3
pentane	2.500%	39.5
unspeciated alkanes	49.169%	36.8

88 External combustion boiler - coke oven gas

US EPA profile number 0005

US EPA profile number 0005

Species	*% of total NMVOC*	*POCP*
acetylene	4.651%	8.5
benzene	11.047%	21.8
ethylene	68.023%	100.0
ethane	14.535%	12.3
propylene	1.744%	112.3

91 External combustion boiler - refinery gas

US EPA profile number 0004

US EPA profile number 0004

Species	*% of total NMVOC*	*POCP*
2-methylpropane	4.762%	30.7
ethane	22.619%	12.3
butane	25.000%	35.2
formaldehyde	8.225%	51.9
propylene	18.939%	112.3
propane	20.455%	17.6

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

94 Flares - natural gas

US EPA profile number 0051

US EPA profile number 0051

Species	*% of total NMVOC*	*POCP*
formaldehyde	25.000%	51.9
ethane	37.500%	12.3
propane	37.500%	17.6

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

95 Internal combustion engine - natural gas

US EPA profile number 1001

US EPA profile number 1001

Species	*% of total NMVOC*	*POCP*
1-octene	0.043%	78.2
1-nonene	0.043%	95.6
2,2-dimethylbutane	0.047%	24.1
2-methylbutane	0.230%	40.5
2,4-dimethylpentane	0.043%	46.6
2,2-dimethylpropane	0.017%	17.3
2-ethyltoluene	0.043%	89.8
2,3-dimethylbutane	0.006%	54.1
1-pentene	0.043%	97.7
2-methyl-2-butene	0.043%	84.2
2-methyl-1-pentene	0.086%	107.2
2-methylpropane	2.108%	30.7
3-ethyltoluene	0.043%	101.9
3-methylheptane	0.086%	45.0
2-methylpropanal	0.086%	51.4
3-methylpentane	0.099%	47.9
2-methylpentane	0.020%	42.0
3-methylhexane	0.043%	36.4
C10 aromatic hydrocarbons	0.043%	132.0
C10 alkanes	0.086%	38.7
acetaldehyde	0.129%	64.1
C10 alkenes	0.086%	87.8
acetylene	1.373%	8.5
butane	5.142%	35.2
benzene	0.472%	21.8
C7 alkanes	0.172%	42.3
cis-2-butene	0.086%	114.6
ethane	60.060%	12.3
C9 alkenes	0.172%	90.8
ethylbenzene	0.043%	73.0
C9 alkanes	0.043%	40.4
formaldehyde	3.475%	51.9
cyclohexane	0.043%	29.0
C8 alkanes	0.086%	42.2
cyclopentane	0.086%	51.5
decane	0.043%	38.4

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Internal combustion engine - natural gas

ethylene	2.703%	100.0
trans-2-pentene	0.043%	111.7
heptane	0.086%	49.4
m-xylene	0.080%	110.8
propane	12.484%	17.6
methylcyclopentane	0.172%	48.1
o-xylene	0.064%	105.3
methylpropene	0.086%	62.7
trans-2-butene	0.558%	113.2
nonane	0.043%	41.4
pentane	0.868%	39.5
p-xylene	0.028%	101.0
methylcyclohexane	0.086%	51.0
toluene	0.172%	63.7
propylene	7.250%	112.3
undecane	0.043%	38.4
octane	0.086%	45.3
hexane	0.128%	48.2
unspeciated aromatic hydrocarbons	0.043%	95.4
1,2,4-trimethylbenzene	0.043%	127.8
1-heptene	0.043%	83.1
1,2,3-trimethylbenzene	0.043%	126.7
1,3,5-trimethylbenzene	0.086%	138.1

96 Iron sintering

US EPA profile number 0013

US EPA profile number 0013

Species	*% of total NMVOC*	*POCP*
ethane	11.236%	12.3
acetylene	55.431%	8.5
ethylene	22.097%	100.0
propylene	11.236%	112.3

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

98 Open hearth furnace with oxygen lance

US EPA profile number 0014

US EPA profile number 0014

Species	*% of total NMVOC*	*POCP*
benzene	13.600%	21.8
toluene	3.600%	63.7
hexane	7.000%	48.2
trimethylfluorosilane	40.000%	0.0
heptane	35.800%	49.4

103 Cement industry

Species profile based on PI data for 1998 and 1999

Species profile based on PI data for 1998 and 1999

Species	*% of total NMVOC*	*POCP*
2-butanone	0.395%	37.3
acetaldehyde	0.179%	64.1
butane	0.850%	35.2
formaldehyde	0.021%	51.9
chloromethane	0.041%	0.5
benzo (a) pyrene	0.004%	0.0
dichloromethane	0.170%	6.8
ethane	1.849%	12.3
benzene	6.897%	21.8
ethylene	2.046%	100.0
benzaldehyde	0.022%	-9.2
m-xylene	0.002%	110.8
trichloroethene	0.021%	32.5
p-xylene	0.002%	101.0
styrene	0.051%	14.2
propylene	0.944%	112.3
unspeciated	85.863%	51.3
o-xylene	0.002%	105.3
1,2,3-trimethylbenzene	0.000%	126.7
1,3,5-trimethylbenzene	0.000%	138.1
1,2,4-trimethylbenzene	0.000%	127.8
1,3-butadiene	0.641%	85.1
1,1,1-trichloroethane	0.001%	0.9

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

104 Paper coating

Based on information from regulators - see naei99\rawdata\datafrmt\voc\species\paper_textile_film_coating.xls

Based on information from regulators - see naei99\rawdata\datafrmt\voc\species\paper_textile_film_coating.xls

Species	*% of total NMVOC*	*POCP*
2,4-dimethyl-1-(1-methylethyl)benzene	0.078%	111.7
2,3,3,4-tetramethylpentane	0.003%	37.2
2,2,3,3-tetramethylhexane	0.157%	19.2
1-methylindan	0.029%	80.0
1-methyl-2-propylbenzene	0.117%	88.4
2,3-dimethylnonane	0.099%	37.7
2,2,5-trimethylhexane	0.010%	37.6
2-methyldecane	0.397%	37.5
2,5-dimethyloctane	0.167%	40.2
2-methyl-1-propanol	0.101%	36.0
2,5-dimethylhexane	0.003%	44.6
2-(2-butoxyethoxy)ethanol	0.118%	50.2
1-propanol	0.008%	56.1
2,3-dimethylundecane	0.024%	31.7
2,4-dimethylheptane	0.021%	42.6
1-methyl-4-tertbutylbenzene	0.066%	87.3
2,3-dimethylheptane	0.133%	42.6
2-methylheptane	0.021%	44.6
2-butoxyethanol	0.004%	48.3
2,5-dimethylheptane	0.063%	51.2
2-butanone	7.297%	37.3
2-methyl-5-ethyloctane	0.138%	38.0
1-methylbutylbenzene	0.064%	105.7
1-methyl-3-(isopropyl)benzene	0.117%	104.1
1-methyl-3-isopropylcyclopentane	0.003%	39.1
2,6-dimethylheptane	0.068%	42.3
2,3,5-trimethylhexane	0.003%	42.6
1-methyl-4-isopropylbenzene	0.398%	89.6
2-methyl-1-butylbenzene	0.008%	86.2
2-ethyl-1,3-dimethylbenzene	0.127%	114.6
2,6-dimethyloctane	0.499%	40.2
2-methyldecalin	0.097%	41.4
2,6-dimethylundecane	0.016%	31.7
2,3-dimethyloctane	0.042%	40.2
1-methylindene	0.003%	136.2

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paper coating

2,6-dimethyldecane	0.065%	35.1
2,5-dimethyldecane	0.052%	34.6
1-methyl-4-isopropylcyclohexane	0.413%	43.0
1-methyl-3-propylbenzene	0.232%	104.1
2-ethoxyethanol	0.073%	38.6
1-methyl-2-isopropylbenzene	0.100%	88.4
2,3,4-trimethylhexane	0.010%	42.9
2,7-dimethyloctane	0.099%	39.9
3,3,4-trimethylhexane	0.003%	37.6
2-methylundecane	0.065%	35.2
3-methylnonane	0.616%	40.2
4-ethyl-1,2-dimethylbenzene	0.086%	114.6
3-methylheptane	0.016%	45.0
4-methylnonane	0.420%	40.2
2-propyl acetate	0.094%	21.1
3-ethyltoluene	0.357%	101.9
5-methylundecane	0.063%	35.1
6-ethyl-2-methyloctane	0.024%	38.0
4-ethyloctane	0.047%	44.4
4-methyl-2-pentanone	0.345%	49.0
2-propanol	9.287%	18.8
3,3,5-trimethylheptane	0.013%	36.2
3-ethylhexane	0.003%	41.5
5-methyldecane	0.201%	37.7
3,4-dimethylhexane	0.003%	45.3
2-methylnonane	0.533%	39.9
4-ethyltoluene	0.148%	90.6
4-methylheptane	0.008%	45.0
3,7-dimethylnonane	0.138%	37.9
3-methylhexane	0.003%	36.4
2-methyloctane	0.183%	42.8
4,6-dimethylindan	0.010%	132.5
3,5-dimethyloctane	0.044%	40.5
3-methyloctane	0.165%	42.6
4,5-dimethylnonane	0.097%	37.9
4,4-dimethylheptane	0.005%	37.2
3,3-dimethylheptane	0.016%	37.2
3-methyldecane	0.447%	37.7
3,6-dimethyloctane	0.123%	40.5

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paper coating

4-propylheptane	0.008%	40.5
3-ethylheptane	0.133%	43.1
3,3-dimethyloctane	0.141%	35.8
3-ethyl-2-methylhexane	0.010%	43.1
3,4-dimethylheptane	0.165%	42.6
3-ethyl-2-methylheptane	0.603%	39.9
3-methylundecane	0.076%	35.1
4,7-dimethylindan	0.004%	132.5
4-methyldecane	0.747%	37.7
3-ethyloctane	0.104%	44.4
6-ethyl-2-methyldecane	0.008%	32.8
4-methyloctane	0.188%	42.3
butyl acetate	1.132%	26.9
butylcyclohexane	0.392%	42.5
decane	2.452%	38.4
formaldehyde	0.528%	51.9
C11 cycloalkanes	0.031%	38.4
butylbenzene	0.102%	69.0
C10 cycloalkanes	0.465%	38.4
C11 alkanes	0.431%	36.4
C8 alkanes	0.003%	42.2
chloromethane	0.037%	0.5
C9 cycloalkanes	0.026%	41.4
ethylisopropylbenzene	0.004%	105.7
C12 alkanes	0.138%	35.7
cyclohexanone	0.008%	29.9
ethylbenzene	0.139%	73.0
6-methylundecane	0.050%	35.1
ethylene glycol	0.564%	37.3
C10 alkanes	0.368%	38.7
C9 alkanes	0.026%	40.4
decalin	0.136%	44.4
ethylcyclohexane	0.141%	48.3
C11 aromatic hydrocarbons	0.004%	134.2
dimethylnonane	0.052%	38.4
C13 alkanes	0.003%	31.7
acetone	0.164%	9.4
ethanol	1.270%	39.9
ethyl acetate	0.703%	20.9

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paper coating

dodecane	0.149%	35.7
cycloheptane	0.003%	53.4
C12 cycloalkanes	0.013%	35.7
hexylcyclohexane	0.003%	36.7
tert-pentylbenzene	0.039%	67.3
indan	0.090%	79.7
trichloroethene	0.013%	32.5
naphthalene	0.014%	97.7
propylcyclohexane	0.509%	45.4
nonane	1.415%	41.4
toluene	7.388%	63.7
tert-butylcyclopropane	0.003%	11.5
isopentylbenzene	0.016%	67.3
heptane	0.005%	49.4
propyl acetate	0.123%	28.2
styrene acrylate	0.005%	0.0
m-xylene	0.277%	110.8
o-xylene	0.184%	105.3
tetramethylcyclohexane	0.076%	38.5
propylbenzene	0.223%	63.6
propylcyclopentane	0.003%	44.5
isopropylbenzene	0.098%	50.0
unspeciated	34.460%	51.3
octahydroindan	0.071%	44.5
pentylcyclohexane	0.097%	39.6
pentylbenzene	0.004%	67.3
methylcyclodecane	0.021%	39.3
undecane	1.282%	38.4
methyltetralin	0.006%	114.0
methylcyclohexane	0.024%	51.0
methoxy-2-propoxy-2-propanol	0.175%	37.5
octane	0.102%	45.3
p-xylene	0.100%	101.0
methanol	10.173%	14.0
vinyl acetate	0.007%	48.5
unspeciated hydrocarbons	0.131%	71.9
unspeciated cycloalkanes	0.016%	43.4
unspeciated alkanes	0.031%	36.8
1,2,4-trimethlycyclopentane	0.003%	43.6

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paper coating

1,2,3,4-tetrahydronaphthalene	0.041%	115.1
1,3-dimethyl-5-propylbenzene	0.012%	132.5
1,3-dimethyl-4-ethylbenzene	0.098%	114.6
1-ethyl-4-methylcyclohexane	0.151%	45.6
(1-methylpropyl)cyclohexane	0.428%	38.5
1,3-ethylmethylcyclopentane	0.005%	44.2
1,2,3,4-tetramethylbenzene	0.053%	114.6
1-ethyl-1,4-dimethylcyclohexane	0.047%	38.7
(2-methylbutyl)cyclohexane	0.031%	39.8
1,1,2-trimethylcyclohexane	0.097%	41.2
1-methyl-1-propylcyclopentane	0.060%	37.9
1-methyl-1-phenylcyclopropane	0.021%	63.7
1,1,3-trimethylcyclohexane	0.110%	41.2
1,2,4,5-tetramethylbenzene	0.049%	114.6
1-methoxy-2-propyl acetate	0.360%	32.3
1,3,5-trimethylbenzene	0.340%	138.1
1,2-propanediol	0.002%	44.6
1-methoxy-2-propanol	0.173%	35.5
1,2,4,4-tetramethylcyclopentane	0.018%	37.5
1,3-diethylbenzene	0.098%	104.1
1-methoxy-2-butanol	0.011%	47.6
1-ethoxy-2-propanol	0.001%	49.7
1-butanol	0.604%	62.0
1,1-dimethylcyclohexane	0.008%	42.8
1-ethylpropylbenzene	0.029%	105.7
1,2-ethylmethylcyclopentane	0.008%	44.2
1,1,4,4-tetramethylcyclohexane	0.068%	34.3
1,2,3,5-tetramethylcyclohexane	0.107%	42.7
1-ethyl-2,3-dimethylbenzene	0.080%	114.6
1,2-dimethyl-3-isopropylcyclopentane	0.037%	39.3
1,4-dimethylcyclohexane	0.112%	48.2
1,2-dimethylcyclohexane	0.050%	48.2
1,4-dimethyl-2-isopropylbenzene	0.016%	111.7
1,2,3,5-tetramethylbenzene	0.066%	136.0
1,2,3-trimethylbenzene	0.305%	126.7
1,3-dimethylcyclohexane	0.044%	48.2
1,2,3-trimethylcyclopentane	0.005%	43.6
(2-methylpropyl)cyclohexane	0.232%	42.7
1,2,4-trimethylcyclohexane	0.063%	45.4

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Paper coating

1-ethyl-2,3-dimethylcyclohexane	0.055%	42.3
1,4-diethylbenzene	0.100%	89.6
1,2,3-trimethylcyclohexane	0.201%	45.4
1-ethyl-3,5-dimethylbenzene	0.109%	136.0
1,2,4-trimethylbenzene	0.703%	127.8
1-ethyl-2,2,6-trimethylcyclohexane	0.120%	37.2
1-ethyl-3-methylcyclohexane	0.355%	45.6
1-ethyl-2-propylcyclohexane	0.050%	40.0
1-ethyl-2-propylbenzene	0.025%	86.2
(1-methylethyl)cyclohexane	0.238%	40.5

105 Print chemicals

Use of IPA in fount solutions

Use of IPA in fount solutions

Species	*% of total NMVOC*	*POCP*
2-propanol	100.000	18.8

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

106 Leather degreasing

Based on information provided by leather industry

see naei99/rawdata/datafrmt/voc/species/leather_degreasing

Species	*% of total NMVOC*	*POCP*
2-methyl-1-butylbenzene	0.016%	86.2
2,5-dimethyldecane	0.107%	34.6
1-methyl-4-isopropylcyclohexane	0.845%	43.0
2-methyl-5-ethyloctane	0.284%	38.0
1-methyl-3-(isopropyl)benzene	0.240%	104.1
2-methyldecane	0.813%	37.5
1-methyl-4-isopropylbenzene	0.816%	89.6
2-ethyl-1,3-dimethylbenzene	0.260%	114.6
2,6-dimethylundecane	0.032%	31.7
2,6-dimethylheptane	0.139%	42.3
1-methyl-4-tertbutylbenzene	0.136%	87.3
1-methyl-2-propylbenzene	0.240%	88.4
2,5-dimethyloctane	0.342%	40.2
2,7-dimethyloctane	0.203%	39.9
2,5-dimethylheptane	0.128%	51.2
1-methyl-3-isopropylcyclopentane	0.005%	39.1
1-methyl-3-propylbenzene	0.476%	104.1
2,5-dimethylhexane	0.005%	44.6
1-methyl-2-isopropylbenzene	0.204%	88.4
2,6-dimethyldecane	0.134%	35.1
2,6-dimethyloctane	1.022%	40.2
2,4-dimethyl-1-(1-methylethyl)benzene	0.160%	111.7
1-methylindene	0.005%	136.2
2,3,5-trimethylhexane	0.005%	42.6
2,3,4-trimethylhexane	0.021%	42.9
2-methyldecalin	0.198%	41.4
2,3-dimethylundecane	0.048%	31.7
2,3,3,4-tetramethylpentane	0.005%	37.2
2,2,5-trimethylhexane	0.021%	37.6
2,3-dimethyloctane	0.086%	40.2
1-methylindan	0.060%	80.0
2,2,3,3-tetramethylhexane	0.321%	19.2
2,4-dimethylheptane	0.043%	42.6
1-methylbutylbenzene	0.132%	105.7
2,3-dimethylnonane	0.203%	37.7

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Leather degreasing

2,3-dimethylheptane	0.273%	42.6
4-ethyl-1,2-dimethylbenzene	0.176%	114.6
3-ethyl-2-methylhexane	0.021%	43.1
3-methyldecane	0.915%	37.7
4,5-dimethylnonane	0.198%	37.9
4-methyloctane	0.385%	42.3
3-methylnonane	1.263%	40.2
4-ethyloctane	0.096%	44.4
4,4-dimethylheptane	0.011%	37.2
5-methyldecane	0.412%	37.7
4-propylheptane	0.016%	40.5
3-ethyl-2-methylheptane	1.236%	39.9
3,7-dimethylnonane	0.284%	37.9
4-methylheptane	0.016%	45.0
5-methylundecane	0.128%	35.1
2-methylnonane	1.091%	39.9
3-ethylheptane	0.273%	43.1
4-methyldecane	1.530%	37.7
4-methylnonane	0.861%	40.2
2-methylheptane	0.043%	44.6
3,4-dimethylhexane	0.005%	45.3
3,3-dimethylheptane	0.032%	37.2
3-methylheptane	0.032%	45.0
3-methylundecane	0.155%	35.1
3,3-dimethyloctane	0.289%	35.8
4,7-dimethylindan	0.008%	132.5
3-ethyloctane	0.214%	44.4
3,3,5-trimethylheptane	0.027%	36.2
3,4-dimethylheptane	0.337%	42.6
4,6-dimethylindan	0.020%	132.5
3,6-dimethyloctane	0.251%	40.5
4-ethyltoluene	0.304%	90.6
3-ethyltoluene	0.732%	101.9
2-methylundecane	0.134%	35.2
3-methylhexane	0.005%	36.4
2-methyloctane	0.375%	42.8
3,3,4-trimethylhexane	0.005%	37.6
3-methyloctane	0.337%	42.6
3,5-dimethyloctane	0.091%	40.5

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Leather degreasing

3-ethylhexane	0.005%	41.5
6-ethyl-2-methyldecane	0.016%	32.8
C12 alkanes	0.284%	35.7
ethylbenzene	0.116%	73.0
C8 alkanes	0.005%	42.2
cycloheptane	0.005%	53.4
C13 alkanes	0.005%	31.7
decalin	0.278%	44.4
ethylcyclohexane	0.289%	48.3
C10 cycloalkanes	0.952%	38.4
C12 cycloalkanes	0.027%	35.7
6-methylundecane	0.102%	35.1
C9 cycloalkanes	0.053%	41.4
C9 alkanes	0.053%	40.4
6-ethyl-2-methyloctane	0.048%	38.0
C11 alkanes	0.883%	36.4
dimethylnonane	0.107%	38.4
butylcyclohexane	0.802%	42.5
decane	5.024%	38.4
C11 aromatic hydrocarbons	0.008%	134.2
C11 cycloalkanes	0.064%	38.4
C10 alkanes	0.754%	38.7
ethylisopropylbenzene	0.008%	105.7
dodecane	0.305%	35.7
butylbenzene	0.208%	69.0
methyltetralin	0.012%	114.0
o-xylene	0.276%	105.3
pentylbenzene	0.008%	67.3
octane	0.209%	45.3
propylbenzene	0.456%	63.6
isopropylbenzene	0.200%	50.0
unspeciated	0.062%	51.3
methylcyclodecane	0.043%	39.3
naphthalene	0.028%	97.7
propylcyclohexane	1.043%	45.4
propylcyclopentane	0.005%	44.5
indan	0.184%	79.7
toluene	0.032%	63.7
isopentylbenzene	0.032%	67.3

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Leather degreasing

pentylcyclohexane	0.198%	39.6
p-xylene	0.096%	101.0
octahydroindan	0.144%	44.5
hexylcyclohexane	0.005%	36.7
methylcyclohexane	0.048%	51.0
tert-butylcyclopropane	0.005%	11.5
tert-pentylbenzene	0.080%	67.3
tetramethylcyclohexane	0.155%	38.5
heptane	0.011%	49.4
nonane	2.900%	41.4
undecane	2.627%	38.4
m-xylene	0.104%	110.8
unspeciated cycloalkanes	0.032%	43.4
unspeciated hydrocarbons	0.267%	71.9
unspeciated alkanes	0.064%	36.8
1,3-ethylmethylcyclopentane	0.011%	44.2
1,1-dimethylcyclohexane	0.016%	42.8
1,1,3-trimethylcyclohexane	0.225%	41.2
1-ethyl-3,5-dimethylbenzene	0.224%	136.0
1-ethyl-2,2,6-trimethylcyclohexane	0.246%	37.2
1-ethyl-2,3-dimethylbenzene	0.164%	114.6
1-ethyl-2-propylcyclohexane	0.102%	40.0
1,2,4,5-tetramethylbenzene	0.100%	114.6
1,4-diethylbenzene	0.204%	89.6
1,2,4-trimethlycyclopentane	0.005%	43.6
1,2,4-trimethylcyclohexane	0.128%	45.4
1,3-diethylbenzene	0.200%	104.1
1,2,3,5-tetramethylcyclohexane	0.219%	42.7
1,4-dimethylcyclohexane	0.230%	48.2
1,3,5-trimethylbenzene	0.696%	138.1
1-ethyl-2-propylbenzene	0.052%	86.2
1,1,4,4-tetramethylcyclohexane	0.139%	34.3
1,2,3-trimethylcyclohexane	0.412%	45.4
1-ethyl-4-methylcyclohexane	0.310%	45.6
1,3-dimethyl-5-propylbenzene	0.024%	132.5
1,3-dimethyl-4-ethylbenzene	0.200%	114.6
1-methyl-1-propylcyclopentane	0.123%	37.9
(2-methylbutyl)cyclohexane	0.064%	39.8
1,4-dimethyl-2-isopropylbenzene	0.032%	111.7

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Leather degreasing

1,2,3-trimethylcyclopentane	0.011%	43.6
1,2,4-trimethylbenzene	1.440%	127.8
1-ethyl-3-methylcyclohexane	0.728%	45.6
1,3-dimethylcyclohexane	0.091%	48.2
1-ethyl-2,3-dimethylcyclohexane	0.112%	42.3
(1-methylethyl)cyclohexane	0.487%	40.5
1,2,3,4-tetramethylbenzene	0.108%	114.6
1,1,2-trimethylcyclohexane	0.198%	41.2
1,1,1-trichloroethane	50.000%	0.9
1,2-dimethylcyclohexane	0.102%	48.2
1-ethyl-1,4-dimethylcyclohexane	0.096%	38.7
1-methyl-1-phenylcyclopropane	0.044%	63.7
(2-methylpropyl)cyclohexane	0.476%	42.7
1,2-dimethyl-3-isopropylcyclopentane	0.075%	39.3
1-ethylpropylbenzene	0.060%	105.7
1,2,3,4-tetrahydronaphthalene	0.084%	115.1
1,2,3,5-tetramethylbenzene	0.136%	136.0
1,2,4,4-tetramethylcyclopentane	0.037%	37.5
1,2,3-trimethylbenzene	0.624%	126.7
(1-methylpropyl)cyclohexane	0.877%	38.5
1,2-ethylmethylcyclopentane	0.016%	44.2

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

107 Carcare products

Based on data from Atlantic Consulting study and US EPA species profiles - see naei99/rawdata/datafrmt/voc/species/consumer products.xls

Based on data from Atlantic Consulting study and US EPA species profiles - see naei99/rawdata/datafrmt/voc/species/consumer products.xls

Species	*% of total NMVOC*	*POCP*
2-ethyl-1,3-dimethylbenzene	0.012%	114.6
1-methyl-3-(isopropyl)benzene	0.011%	104.1
1-methylindene	0.000%	136.2
2-methyl-1-butylbenzene	0.001%	86.2
2,3,5-trimethylhexane	0.000%	42.6
2-butanone	0.009%	37.3
2,6-dimethylheptane	0.006%	42.3
1-propanol	0.003%	56.1
2-methyldecane	0.036%	37.5
2-methyldecalin	0.009%	41.4
2-chlorotoluene	0.000%	13.1
2,6-dimethyloctane	0.045%	40.2
2,3-dimethylheptane	0.012%	42.6
2-(2-butoxyethoxy)ethanol	0.000%	50.2
2-butoxyethanol	0.076%	48.3
2,2,3,3-tetramethylhexane	0.014%	19.2
2-(2-hydroxy-ethoxy)ethanol	0.012%	40.1
1-methyl-3-isopropylcyclopentane	0.000%	39.1
2,5-dimethyldecane	0.005%	34.6
2,6-dimethylundecane	0.001%	31.7
1-methyl-2-propylbenzene	0.011%	88.4
1-methyl-3-propylbenzene	0.021%	104.1
2-methyl-5-ethyloctane	0.013%	38.0
2,3-dimethylnonane	0.009%	37.7
2,7-dimethyloctane	0.009%	39.9
2,3-dimethylbutane	0.003%	54.1
1-methyl-4-isopropylbenzene	0.036%	89.6
2,5-dimethyloctane	0.015%	40.2
2,5-dimethylheptane	0.006%	51.2
2,4-dimethylheptane	0.002%	42.6
2,6-dimethyldecane	0.006%	35.1
2,4-dimethyl-1-(1-methylethyl)benzene	0.007%	111.7
1-methylindan	0.003%	80.0
2,5-dimethylhexane	0.000%	44.6

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Carcare products

2,2,5-trimethylhexane	0.001%	37.6
2-methoxyethanol	0.000%	30.7
2,3-dimethylundecane	0.002%	31.7
2,3,3,4-tetramethylpentane	0.000%	37.2
1-methyl-2-isopropylbenzene	0.009%	88.4
1-methyl-4-tertbutylbenzene	0.006%	87.3
2,3-dimethyloctane	0.004%	40.2
1-methyl-1-propylcyclopentane	0.005%	37.9
1-methylbutylbenzene	0.006%	105.7
1-methyl-4-isopropylcyclohexane	0.038%	43.0
2,3,4-trimethylhexane	0.001%	42.9
4-ethyltoluene	0.014%	90.6
2-methylnonane	0.049%	39.9
4-ethyloctane	0.004%	44.4
2-methylpropane	0.052%	30.7
4-methyloctane	0.017%	42.3
4-propylheptane	0.001%	40.5
2-methylheptane	0.002%	44.6
2-methylpropyl acetate	0.000%	21.3
4-methyldecane	0.068%	37.7
2-methylpentane	0.031%	42.0
3-methyloctane	0.015%	42.6
3-methyldecane	0.041%	37.7
4-methylnonane	0.038%	40.2
2-methylundecane	0.006%	35.2
6-ethyl-2-methyldecane	0.001%	32.8
4-methyl-2-pentanol	0.000%	60.9
2-methyloctane	0.017%	42.8
3-methylundecane	0.007%	35.1
3,3,5-trimethylheptane	0.001%	36.2
4,5-dimethylnonane	0.009%	37.9
4-methylheptane	0.001%	45.0
3,6-dimethyloctane	0.011%	40.5
3-methylnonane	0.056%	40.2
4-ethyl-1,2-dimethylbenzene	0.008%	114.6
3,5-dimethyloctane	0.004%	40.5
3-ethylhexane	0.000%	41.5
3-ethyltoluene	0.033%	101.9
3,7-dimethylnonane	0.013%	37.9

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Carcare products

3,4-dimethylhexane	0.000%	45.3
3-methylhexane	0.000%	36.4
4,6-dimethylindan	0.001%	132.5
3,4-dimethylheptane	0.015%	42.6
4-methyl-4-hydroxy-2-pentanone	0.000%	30.7
3,3-dimethylheptane	0.001%	37.2
2-propanol	0.064%	18.8
4,7-dimethylindan	0.000%	132.5
3,3-dimethyloctane	0.013%	35.8
3-methylheptane	0.001%	45.0
3-ethyloctane	0.010%	44.4
3,3,4-trimethylhexane	0.000%	37.6
4,4-dimethylheptane	0.000%	37.2
4-methyl-2-pentanone	0.000%	49.0
3-ethylheptane	0.012%	43.1
3-ethyl-2-methylheptane	0.055%	39.9
3-ethyl-2-methylhexane	0.001%	43.1
5-methyldecane	0.018%	37.7
3-methylpentane	0.028%	47.9
5-methylundecane	0.006%	35.1
cycloheptane	0.000%	53.4
acetone	0.010%	9.4
C11 cycloalkanes	0.003%	38.4
C9 alkanes	0.002%	40.4
ethanol	0.153%	39.9
C11 aromatic hydrocarbons	0.000%	134.2
cyclohexane	0.030%	29.0
6-ethyl-2-methyloctane	0.002%	38.0
C10 alkanes	0.034%	38.7
ethylbenzene	0.020%	73.0
ethylene glycol	2.570%	37.3
ethylisopropylbenzene	0.000%	105.7
6-methylundecane	0.005%	35.1
C11 alkanes	0.039%	36.4
dimethylpentane	0.014%	49.4
butylbenzene	0.009%	69.0
dimethylcyclopentane	0.014%	45.8
butyl acetate	0.000%	26.9
acetic acid	0.000%	9.7

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Carcare products

dimethylnonane	0.005%	38.4
decane	0.223%	38.4
dimethyl ether	0.003%	18.9
C13 alkanes	0.000%	31.7
C8 alkanes	0.000%	42.2
ethylcyclohexane	0.013%	48.3
dodecane	0.014%	35.7
decalin	0.012%	44.4
C10 cycloalkanes	0.042%	38.4
butane	0.001%	35.2
C9 cycloalkanes	0.002%	41.4
C12 alkanes	0.013%	35.7
ethyl acetate	0.000%	20.9
butylcyclohexane	0.036%	42.5
cyclohexanone	0.000%	29.9
C12 cycloalkanes	0.001%	35.7
methylcyclopentane	0.020%	48.1
pentylbenzene	0.000%	67.3
m-xylene	0.041%	110.8
nonane	0.129%	41.4
hexane	0.082%	48.2
limonene	0.312%	74.5
isopropylbenzene	0.009%	50.0
methylcyclodecane	0.002%	39.3
propylcyclopentane	0.000%	44.5
naphthalene	0.001%	97.7
undecane	0.117%	38.4
pentylcyclohexane	0.009%	39.6
hexylcyclohexane	0.000%	36.7
heptane	0.035%	49.4
propylbenzene	0.020%	63.6
pine oil	0.000%	74.5
methylcyclohexane	0.013%	51.0
octane	0.009%	45.3
naphthol	0.186%	61.1
tetrachloroethene	0.007%	2.9
unspeciated	0.427%	51.3
toluene	0.032%	63.7
methyltetralin	0.001%	114.0

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Carcare products

methylhexane	0.050%	38.8
methanol	91.550%	14.0
hexachloroethane	0.000%	0.0
isopentylbenzene	0.001%	67.3
tetramethylcyclohexane	0.007%	38.5
propylcyclohexane	0.046%	45.4
trichloroethene	0.000%	32.5
p-xylene	0.013%	101.0
octahydroindan	0.006%	44.5
indan	0.008%	79.7
tert-pentylbenzene	0.004%	67.3
propane	0.014%	17.6
tert-butylcyclopropane	0.000%	11.5
o-xylene	0.020%	105.3
unspeciated alkanes	0.003%	36.8
unspeciated aliphatic hydrocarbons	0.312%	36.8
unspeciated hydrocarbons	0.082%	71.9
unspeciated aromatic hydrocarbons	0.119%	95.4
unspeciated cycloalkanes	0.001%	43.4
1,4-diethylbenzene	0.009%	89.6
1-ethyl-2-propylbenzene	0.002%	86.2
1,2,3-trimethylbenzene	0.028%	126.7
1,1,2-trimethylcyclohexane	0.009%	41.2
1-ethyl-2,3-dimethylbenzene	0.007%	114.6
(2-methylbutyl)cyclohexane	0.003%	39.8
1,2,4,5-tetramethylbenzene	0.004%	114.6
1,2,4-trimethylcyclohexane	0.006%	45.4
1-ethyl-2,3-dimethylcyclohexane	0.005%	42.3
1-methyl-1-phenylcyclopropane	0.002%	63.7
1,1,3-trimethylcyclohexane	0.010%	41.2
1,4-dimethyl-2-isopropylbenzene	0.001%	111.7
1,3,5-trimethylbenzene	0.031%	138.1
1-butoxy-2-propanol	0.000%	46.3
1,3-dimethyl-4-ethylbenzene	0.009%	114.6
1-methoxy-2-ethanol	1.400%	30.7
1,2,4,4-tetramethylcyclopentane	0.002%	37.5
1,2-ethylmethylcyclopentane	0.001%	44.2
1,2,3,5-tetramethylbenzene	0.006%	136.0
1,2,3,4-tetrahydronaphthalene	0.004%	115.1

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Carcare products

(1-methylpropyl)cyclohexane	0.039%	38.5
1-ethyl-3,5-dimethylbenzene	0.010%	136.0
1,3-dimethylcyclohexane	0.004%	48.2
1-ethyl-2,2,6-trimethylcyclohexane	0.011%	37.2
1-ethyl-4-methylcyclohexane	0.014%	45.6
1,2,3-trimethylcyclopentane	0.000%	43.6
1-ethyl-1,4-dimethylcyclohexane	0.004%	38.7
1,3-dimethyl-5-propylbenzene	0.001%	132.5
1-ethyl-3-methylcyclohexane	0.032%	45.6
1,2,3,4-tetramethylbenzene	0.005%	114.6
1,2-dimethylcyclohexane	0.005%	48.2
1,2-dimethyl-3-isopropylcyclopentane	0.003%	39.3
1,4-dimethylcyclohexane	0.010%	48.2
1,1,4,4-tetramethylcyclohexane	0.006%	34.3
1,2,3-trimethylcyclohexane	0.018%	45.4
1-methoxy-2-propanol	0.013%	35.5
1,2,3,5-tetramethylcyclohexane	0.010%	42.7
(1-methylethyl)cyclohexane	0.022%	40.5
1-ethylpropylbenzene	0.003%	105.7
(2-methylpropyl)cyclohexane	0.021%	42.7
1,2-dichlorobenzene	0.001%	12.0
1,2,4-trimethlycyclopentane	0.000%	43.6
1-ethyl-2-propylcyclohexane	0.005%	40.0
1,3-ethylmethylcyclopentane	0.000%	44.2
1,1-dimethylcyclohexane	0.001%	42.8
1,2,4-trimethylbenzene	0.064%	127.8
1,3-diethylbenzene	0.009%	104.1

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

108 Road transport, petrol, conventional

COPERT III

Profile taken from COPERT III, methodology & emission factors report, Version 2.1, November 2000

Species	*% of total NMVOC*	*POCP*
1-pentene	0.090%	97.7
2-methyl benzaldehyde	0.190%	-9.2
2-butene	1.270%	113.9
2-methylbutane	4.860%	40.5
2-butanone	0.110%	37.3
1-propanal	0.110%	79.8
2-methylhexane	0.800%	41.1
4-methyl benzaldehyde	0.190%	-9.2
2-methylpropane	1.290%	30.7
2-methylpropene	4.210%	62.7
2-pentene	0.230%	111.9
3-methylhexane	0.560%	36.4
3-methylheptane	0.400%	45.0
3-methyl benzaldehyde	0.380%	-9.2
acetaldehyde	0.590%	64.1
crotonaldehyde	0.020%	70.0
benzaldehyde	0.600%	-9.2
acrolein	0.160%	73.0
ethylbenzene	4.780%	73.0
formaldehyde	2.080%	51.9
benzene	6.830%	21.8
acetylene	5.500%	8.5
decane	0.220%	38.4
C12 alkanes	0.010%	35.7
C13+ alkanes	0.060%	31.7
C13+ aromatic hydrocarbons	6.010%	128.3
C11 alkanes	0.010%	36.4
ethylene	8.710%	100.0
butane	2.900%	35.2
acetone	0.210%	9.4
ethane	1.650%	12.3
C9 aromatic hydrocarbons	3.120%	98.6
C10 alkanes	0.010%	38.7
octane	0.560%	45.3
propane	0.470%	17.6

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Road transport, petrol, conventional

propylene	4.870%	112.3
styrene	0.570%	14.2
m-xylene	3.756%	110.8
p-xylene	2.904%	101.0
heptane	0.360%	49.4
o-xylene	4.520%	105.3
toluene	12.840%	63.7
pentane	1.780%	39.5
propyne	0.760%	74.6
nonane	0.060%	41.4
hexane	1.290%	48.2
unspeciated	0.020%	51.3
unspeciated cycloalkanes	0.880%	43.4
1,2,4-trimethylbenzene	2.530%	127.8
1,3,5-trimethylbenzene	1.110%	138.1
1,3-butadiene	1.420%	85.1
1,2,3-trimethylbenzene	0.590%	126.7
1-butene	0.500%	107.9
1-butyne	0.050%	73.2

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

109 Road transport, petrol, catalysts

COPERT III

Profile taken from COPERT III, methodology & emission factors report, Version 2.1, November 2000

Species	*% of total NMVOC*	*POCP*
2-methylbutane	6.810%	40.5
2-butene	1.420%	113.9
2-methyl benzaldehyde	0.070%	-9.2
1-propanal	0.050%	79.8
2-butanone	0.050%	37.3
1-pentene	0.110%	97.7
1-pentanal	0.010%	76.5
2-methylhexane	1.480%	41.1
2-methylpropenal	0.050%	82.9
2-methylpropene	2.220%	62.7
3-methylheptane	0.540%	45.0
3-methylhexane	1.140%	36.4
4-methyl benzaldehyde	0.060%	-9.2
3-methyl benzaldehyde	0.130%	-9.2
2-pentene	0.340%	111.9
2-methylpropane	1.590%	30.7
2-methylheptane	0.570%	44.6
ethylene	7.300%	100.0
C12 alkanes	0.587%	35.7
acetone	0.610%	9.4
C13+ alkanes	1.450%	31.7
decane	0.190%	38.4
crotonaldehyde	0.040%	70.0
butane	5.240%	35.2
C11 alkanes	0.587%	36.4
acetylene	2.810%	8.5
acetaldehyde	0.750%	64.1
C9 aromatic hydrocarbons	4.210%	98.6
dimethylhexene	0.150%	93.7
ethylbenzene	1.890%	73.0
formaldehyde	1.700%	51.9
C10 alkanes	0.587%	38.7
benzene	5.610%	21.8
ethane	3.190%	12.3
C13+ aromatic hydrocarbons	3.460%	128.3

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Road transport, petrol, catalysts

benzaldehyde	0.220%	-9.2
C10 aromatic hydrocarbons	3.070%	132.0
acrolein	0.190%	73.0
propane	0.650%	17.6
heptane	0.740%	49.4
pentane	2.150%	39.5
o-xylene	2.260%	105.3
octane	0.530%	45.3
propadiene	0.050%	84.7
nonane	0.160%	41.4
propyne	0.080%	74.6
styrene	1.010%	14.2
toluene	10.980%	63.7
propylene	3.820%	112.3
m-xylene	3.063%	110.8
p-xylene	2.367%	101.0
hexane	1.610%	48.2
unspeciated	0.350%	51.3
unspeciated cycloalkanes	1.140%	43.4
1,3-butadiene	0.910%	85.1
1-hexene	0.170%	87.4
1-butyne	0.210%	73.2
1-butene	0.730%	107.9
1-butanal	0.050%	79.5
1,3,5-trimethylbenzene	1.420%	138.1
1,2,4-trimethylbenzene	4.210%	127.8
1,2,3-trimethylbenzene	0.860%	126.7

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

110 Road transport, diesel, light duty

COPERT III

Profile taken from COPERT III, methodology & emission factors report, Version 2.1, November 2000

Species	*% of total NMVOC*	*POCP*
1-propanal	1.770%	79.8
2-butene	0.520%	113.9
1-pentanal	0.410%	76.5
2-butanone	1.200%	37.3
2-methyl benzaldehyde	0.240%	-9.2
2-methylbutane	0.520%	40.5
2-methylpropene	1.110%	62.7
2-methylpropanal	2.090%	51.4
2-methylheptane	0.120%	44.6
3-methylheptane	0.200%	45.0
2-methylpropane	0.070%	30.7
3-methylbutanal	0.110%	78.6
3-methylhexane	0.220%	36.4
4-methyl benzaldehyde	0.350%	-9.2
2-methylpropenal	0.770%	82.9
3-methyl benzaldehyde	0.340%	-9.2
2-methylhexane	0.450%	41.1
acrolein	3.580%	73.0
butane	0.110%	35.2
acetaldehyde	6.470%	64.1
decane	1.180%	38.4
acetone	2.940%	9.4
C13+ alkanes	17.910%	31.7
C13+ aromatic hydrocarbons	13.370%	128.3
benzene	1.980%	21.8
ethylene	10.970%	100.0
ethylbenzene	0.290%	73.0
C11 alkanes	0.717%	36.4
formaldehyde	12.000%	51.9
benzaldehyde	0.860%	-9.2
ethane	0.330%	12.3
C10 alkanes	0.717%	38.7
crotonaldehyde	1.100%	70.0
C12 alkanes	0.717%	35.7
C9 aromatic hydrocarbons	0.780%	98.6

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Road transport, diesel, light duty

acetylene	2.340%	8.5
propane	0.110%	17.6
octane	0.250%	45.3
styrene	0.370%	14.2
o-xylene	0.270%	105.3
toluene	0.690%	63.7
p-xylene	0.266%	101.0
heptane	0.200%	49.4
propylene	3.600%	112.3
nonane	0.670%	41.4
m-xylene	0.344%	110.8
pentane	0.040%	39.5
unspeciated	0.580%	51.3
unspeciated cycloalkanes	0.650%	43.4
1-hexanal	0.160%	100.0
1-butanal	0.850%	79.5
1,3,5-trimethylbenzene	0.310%	138.1
1,3-butadiene	0.970%	85.1
1,2,4-trimethylbenzene	0.570%	127.8
1,2,3-trimethylbenzene	0.250%	126.7

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

111 Road transport, diesel, heavy duty

COPERT III

Profile taken from COPERT III, methodology & emission factors report, Version 2.1, November 2000

Species	*% of total NMVOC*	*POCP*
1-propanal	1.250%	79.8
1-pentanal	0.400%	76.5
2-methyl benzaldehyde	0.800%	-9.2
2-methylpropene	1.700%	62.7
3-methylhexane	0.350%	36.4
2-methylhexane	0.630%	41.1
3-methyl benzaldehyde	0.590%	-9.2
2-methylheptane	0.210%	44.6
2-methylpropanal	0.590%	51.4
2-methylpropane	0.140%	30.7
3-methylheptane	0.270%	45.0
2-methylpropenal	0.860%	82.9
3-methylbutanal	0.090%	78.6
ethylene	7.010%	100.0
crotonaldehyde	1.480%	70.0
benzaldehyde	1.370%	-9.2
C13+ aromatic hydrocarbons	20.370%	128.3
decane	1.790%	38.4
formaldehyde	8.400%	51.9
acetylene	1.050%	8.5
benzene	0.070%	21.8
butane	0.150%	35.2
ethane	0.030%	12.3
C13+ alkanes	27.500%	31.7
C9 aromatic hydrocarbons	1.170%	98.6
acetaldehyde	4.570%	64.1
acrolein	1.770%	73.0
pentane	0.060%	39.5
m-xylene	0.553%	110.8
propylene	1.320%	112.3
p-xylene	0.427%	101.0
heptane	0.300%	49.4
toluene	0.010%	63.7
o-xylene	0.400%	105.3
propane	0.100%	17.6

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Road transport, diesel, heavy duty

styrene	0.560%	14.2
unspeciated	3.290%	51.3
unspeciated cycloalkanes	1.160%	43.4
1-butanal	0.880%	79.5
1,2,3-trimethylbenzene	0.300%	126.7
1,2,4-trimethylbenzene	0.860%	127.8
1-hexanal	1.420%	100.0
1,3,5-trimethylbenzene	0.450%	138.1
1,3-butadiene	3.300%	85.1

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

112 Road transport, LPG

COPERT III

Profile taken from COPERT III, methodology & emission factors report, Version 2.1, November 2000

Species	*% of total NMVOC*	*POCP*
2-methylbutane	1.260%	40.5
1-propanal	0.700%	79.8
2-butene	0.530%	113.9
2-methylhexane	0.250%	41.1
2-methylpropenal	0.100%	82.9
2-methylpropene	0.630%	62.7
3-methylbutanal	0.010%	78.6
2-methylheptane	0.090%	44.6
3-methylheptane	0.080%	45.0
2-methylpropane	6.950%	30.7
3-methylhexane	0.190%	36.4
C11 alkanes	0.003%	36.4
butane	15.500%	35.2
ethylene	5.200%	100.0
formaldehyde	1.560%	51.9
acetone	0.780%	9.4
C12 alkanes	0.003%	35.7
benzaldehyde	0.030%	-9.2
ethane	2.340%	12.3
ethylbenzene	0.240%	73.0
acetylene	1.280%	8.5
crotonaldehyde	0.360%	70.0
C10 alkanes	0.003%	38.7
benzene	0.630%	21.8
acetaldehyde	1.810%	64.1
acrolein	0.590%	73.0
C9 aromatic hydrocarbons	0.250%	98.6
propylene	5.190%	112.3
o-xylene	0.260%	105.3
pentane	0.350%	39.5
m-xylene	0.423%	110.8
toluene	1.220%	63.7
heptane	0.180%	49.4
p-xylene	0.327%	101.0
propane	49.850%	17.6

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

styrene	0.020%	14.2
octane	0.040%	45.3
nonane	0.010%	41.4
unspeciated	0.020%	51.3
unspeciated cycloalkanes	0.100%	43.4
1-butanal	0.110%	79.5
1,3-butadiene	0.150%	85.1
1,2,4-trimethylbenzene	0.250%	127.8
1,3,5-trimethylbenzene	0.080%	138.1
1,2,3-trimethylbenzene	0.050%	126.7

113 Road transport, petrol, evaporative

COPERT III

Profile taken from COPERT III, methodology & emission factors report, Version 2.1, November 2000

Species	*% of total NMVOC*	*POCP*
1-pentene	2.000%	97.7
2-butene	2.000%	113.9
2-methylbutane	25.000%	40.5
2-methylpropane	10.000%	30.7
2-pentene	3.000%	111.9
butane	20.000%	35.2
benzene	1.000%	21.8
m-xylene	0.282%	110.8
pentane	15.000%	39.5
propane	1.000%	17.6
p-xylene	0.218%	101.0
toluene	1.000%	63.7
heptane	2.000%	49.4
hexane	15.000%	48.2
1-butene	1.000%	107.9
1,3-hexadiene	1.500%	103.7

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

114 Shipping

Profile from CORINAIR/EMEP Emission Inventory Guidebook, section B864 (based on Cooper et al,1996 - Atmos. Env. Vol 30, No 14, pp 2463-2473)

CORINAIR Guidebook, Section B864, (based on Cooper et al,1996 - Atmos. Env. Vol 30, No 14, pp 2463-2473)

Species	*% of total NMVOC*	*POCP*
1-pentene	0.500%	97.7
2-methylpropene	9.500%	62.7
dodecane	7.000%	35.7
benzene	19.500%	21.8
ethylene	12.500%	100.0
decane	12.500%	38.4
ethylbenzene	0.500%	73.0
nonane	5.000%	41.4
p-xylene	1.744%	101.0
toluene	10.000%	63.7
undecane	9.500%	38.4
propylene	4.000%	112.3
o-xylene	2.000%	105.3
m-xylene	2.256%	110.8
1-butene	0.500%	107.9
1,2,4-trimethylbenzene	1.000%	127.8
1,3,5-trimethylbenzene	1.000%	138.1
1,2,3-trimethylbenzene	1.500%	126.7

115 Waste incineration

US EPA profile number 0122

US EPA profile number 0122

Species	*% of total NMVOC*	*POCP*
benzene	39.286%	21.8
ethane	13.776%	12.3
ethylene	44.388%	100.0
propylene	2.551%	112.3

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

116 Solvent use: SBP 65/70

Provided by solvent supplier

Data from solvent supplier

Species	*% of total NMVOC*	*POCP*
2,3-dimethylbutane	2.000%	54.1
3-methylpentane	18.000%	47.9
2-methylpentane	20.000%	42.0
cyclohexane	3.000%	29.0
hexane	49.000%	48.2
methylcyclopentane	8.000%	48.1

117 Solvent use: SBP 80/110

Provided by solvent supplier

Data from solvent supplier

Species	*% of total NMVOC*	*POCP*
2,2-dimethylpentane	2.250%	38.6
2,3-dimethylpentane	2.250%	39.1
2,4-dimethylpentane	2.250%	46.6
3-methylhexane	16.000%	36.4
3,3-dimethylpentane	2.250%	37.8
2-methylhexane	16.000%	41.1
dimethylcyclopentane	9.000%	45.8
cyclohexane	16.000%	29.0
methylcyclohexane	7.000%	51.0
methylcyclopentane	5.000%	48.1
heptane	19.000%	49.4
hexane	3.000%	48.2

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

118 Solvent use: SBP solvent (average)

Average of profiles 116 and 117

Data from solvent supplier

Species	*% of total NMVOC*	*POCP*
2,3-dimethylpentane	1.125%	39.1
2,3-dimethylbutane	1.000%	54.1
2,2-dimethylpentane	1.125%	38.6
2,4-dimethylpentane	1.125%	46.6
2-methylpentane	10.000%	42.0
3,3-dimethylpentane	1.125%	37.8
3-methylpentane	9.000%	47.9
2-methylhexane	8.000%	41.1
3-methylhexane	8.000%	36.4
cyclohexane	9.500%	29.0
dimethylcyclopentane	4.500%	45.8
methylcyclohexane	3.500%	51.0
methylcyclopentane	6.500%	48.1
heptane	9.500%	49.4
hexane	26.000%	48.2

119 Solvent use: Aromatic hydrocarbons 160-180oC

Provided by solvent supplier

Data from solvent supplier

Species	*% of total NMVOC*	*POCP*
diethylbenzene	2.000%	105.7
ethyldimethylbenzene	7.000%	132.0
methylpropylbenzene	4.000%	105.7
methylethylbenzene	30.000%	94.1
propylbenzene	4.000%	63.6
unspeciated aromatic hydrocarbons	5.000%	95.4
1,2,3,4-tetramethylbenzene	0.667%	114.6
1,3,5-trimethylbenzene	8.000%	138.1
1,2,3-trimethylbenzene	7.000%	126.7
1,2,4-trimethylbenzene	31.000%	127.8
1,2,3,5-tetramethylbenzene	0.667%	136.0
1,2,4,5-tetramethylbenzene	0.667%	114.6

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

120 Solvent use: Aromatic hydrocarbons 180-220oC

Provided by solvent supplier

Data from solvent supplier

Species	*% of total NMVOC*	*POCP*
ethyldimethylbenzene	25.000%	132.0
diethylbenzene	2.000%	105.7
naphthalene	5.000%	97.7
indan	2.000%	79.7
methylethylbenzene	4.000%	94.1
methylindane	4.000%	80.0
methylpropylbenzene	9.000%	105.7
unspeciated aromatic hydrocarbons	8.000%	95.4
1,2,3,4-tetramethylbenzene	4.000%	114.6
1,2,4-trimethylbenzene	11.000%	127.8
1,3,5-trimethylbenzene	2.000%	138.1
1,2,4,5-tetramethylbenzene	7.000%	114.6
1,2,3-trimethylbenzene	6.000%	126.7
1,2,3,5-tetramethylbenzene	11.000%	136.0

121 Solvent use: Solvent xylene

Provided by SIA

Data from SIA

Species	*% of total NMVOC*	*POCP*
ethylbenzene	20.000%	73.0
o-xylene	12.000%	105.3
p-xylene	13.000%	101.0
m-xylene	55.000%	110.8

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

122 Domestic combustion of coal

Based on data from CRE reports - see naei99/rawdata/datafrmt/voc/species/domestic_coal_and_ssf.xls

Based on data from CRE reports - see naei99/rawdata/datafrmt/voc/species/domestic_coal_and_ssf.xls

Species	*% of total NMVOC*	*POCP*
2-butene	1.461%	113.9
1-pentene	0.805%	97.7
2-methylbutane	8.936%	40.5
2-methyl-2-butene	0.543%	84.2
2-methyl-1-butene	0.345%	77.1
2-methylpropane	6.199%	30.7
3-methyl-1-butene	0.440%	67.1
2-methylpropene	0.365%	62.7
2-pentene	1.831%	111.9
2-propanol	0.060%	18.8
cyclohexane	1.094%	29.0
decane	0.243%	38.4
butylbenzene	0.125%	69.0
ethane	23.980%	12.3
C9 aromatic hydrocarbons	0.196%	98.6
ethylene	8.858%	100.0
benzene	4.414%	21.8
butane	8.674%	35.2
C6 alkenes	1.199%	95.7
ethylbenzene	0.536%	73.0
toluene	2.789%	63.7
p-xylene	1.139%	101.0
o-xylene	0.833%	105.3
nonane	0.362%	41.4
propane	9.474%	17.6
heptane	0.566%	49.4
propylbenzene	0.699%	63.6
m-xylene	1.469%	110.8
hexane	0.579%	48.2
methylcyclohexane	0.202%	51.0
naphthalene	2.032%	97.7
octane	0.422%	45.3
pentane	0.484%	39.5
propylene	8.036%	112.3
1-butene	0.609%	107.9

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

123 Domestic combustion of solid smokeless fuel

Based on data from CRE reports - see naei99/rawdata/datafrmt/voc/species/domestic_coal_and_ssf.xls

Based on data from CRE reports - see naei99/rawdata/datafrmt/voc/species/domestic_coal_and_ssf.xls

Species	*% of total NMVOC*	*POCP*
1-pentene	0.749%	97.7
2-butene	9.267%	113.9
2-methyl-1-butene	0.321%	77.1
2-methyl-2-butene	0.505%	84.2
2-methylpropane	0.696%	30.7
2-pentene	1.704%	111.9
3-methyl-1-butene	0.409%	67.1
2-methylpropene	2.317%	62.7
cyclohexane	2.354%	29.0
ethylene	5.673%	100.0
ethane	9.874%	12.3
C6 alkenes	7.972%	95.7
benzene	4.436%	21.8
butane	0.696%	35.2
C9 aromatic hydrocarbons	0.291%	98.6
toluene	21.312%	63.7
naphthalene	2.841%	97.7
heptane	16.012%	49.4
m-xylene	0.388%	110.8
pentane	4.696%	39.5
p-xylene	0.301%	101.0
propylene	0.450%	112.3
propane	2.654%	17.6
o-xylene	0.220%	105.3
1-butene	3.861%	107.9

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

124 Gas leakage

Profile given in Gillham et al, 1991 but original source not known

Profile given in NAEI report for 1991 (Gillham et al, 1991) but no information on original source

Species	*% of total NMVOC*	*POCP*
2,3-dimethylbutane	0.180%	54.1
2-methylbutane	2.085%	40.5
2-methylpentane	0.551%	42.0
3-methylhexane	0.221%	36.4
2-methylheptane	0.074%	44.6
3-methyloctane	0.010%	42.6
4-methylnonane	0.003%	40.2
5-methylnonane	0.003%	40.1
2-methylhexane	0.201%	41.1
3-methylpentane	0.341%	47.9
2-methylnonane	0.003%	39.9
3-methylnonane	0.003%	40.2
3-methylheptane	0.074%	45.0
2-methyloctane	0.010%	42.8
4-methyloctane	0.010%	42.3
2-methylpropane	3.770%	30.7
4-methylheptane	0.074%	45.0
ethane	65.018%	12.3
benzene	1.113%	21.8
decane	0.050%	38.4
butane	4.682%	35.2
propane	16.252%	17.6
o-xylene	0.030%	105.3
pentane	1.694%	39.5
toluene	0.031%	63.7
m-xylene	0.030%	110.8
octane	0.201%	45.3
hexane	0.822%	48.2
p-xylene	0.030%	101.0
heptane	0.431%	49.4
nonane	0.130%	41.4
unspeciated	1.865%	51.3
1,2,4-trimethylbenzene	0.010%	127.8

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

125 Domestic wood combustion

Profile calculated by combining US EPA profile number 1084 and PAH emission factors for 2 and 3 ring PAHs

Profile calculated by combining US EPA profile number 1084 and PAH emission factors for 2 and 3 ring PAHs

Species	*% of total NMVOC*	*POCP*
2-methylpropane	0.140%	30.7
benzene	29.501%	21.8
acenaphthene	0.057%	121.9
ethylene	25.554%	100.0
fluorene	0.153%	77.4
ethane	8.128%	12.3
anthracene	0.120%	138.9
acenaphthylene	1.452%	145.6
ethanol	25.694%	39.9
propane	2.137%	17.6
propylene	3.120%	112.3
phenanthrene	0.451%	97.8
naphthalene	1.668%	97.7
unspeciated	1.061%	51.3
1-butene	0.764%	107.9

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

126 Industrial wood combustion

Profile calculated by combining US EPA profile number 1084 and PAH emission factors for 2 and 3 ring PAHs

Profile calculated by combining US EPA profile number 1084 and PAH emission factors for 2 and 3 ring PAHs

Species	*% of total NMVOC*	*POCP*
2-methylpropane	0.146%	30.7
acenaphthene	0.000%	121.9
anthracene	0.000%	138.9
ethylene	26.590%	100.0
fluorene	0.000%	77.4
acenaphthylene	0.000%	145.6
ethane	8.457%	12.3
ethanol	26.736%	39.9
benzene	30.697%	21.8
phenanthrene	0.001%	97.8
propylene	3.247%	112.3
naphthalene	0.003%	97.7
propane	2.224%	17.6
unspeciated	1.104%	51.3
1-butene	0.795%	107.9

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

127 Gasification processes

Combination of profile 124 but with PI benzene data used instead - see naei99/rawdata/datafrmt/voc/gasification99.xls

Combination of profile 124 but with PI benzene data used instead - see naei99/rawdata/datafrmt/voc/gasification99.xls

Species	*% of total NMVOC*	*POCP*
2-methylbutane	2.090%	40.5
2,3-dimethylbutane	0.181%	54.1
3-methylpentane	0.342%	47.9
3-methylheptane	0.074%	45.0
2-methylhexane	0.201%	41.1
3-methylnonane	0.003%	40.2
3-methyloctane	0.010%	42.6
5-methylnonane	0.003%	40.1
2-methyloctane	0.010%	42.8
4-methyloctane	0.010%	42.3
4-methylnonane	0.003%	40.2
3-methylhexane	0.221%	36.4
4-methylheptane	0.074%	45.0
2-methylnonane	0.003%	39.9
2-methylpentane	0.553%	42.0
2-methylpropane	3.779%	30.7
2-methylheptane	0.074%	44.6
benzene	0.872%	21.8
decane	0.050%	38.4
butane	4.694%	35.2
ethane	65.177%	12.3
toluene	0.031%	63.7
propane	16.292%	17.6
o-xylene	0.030%	105.3
hexane	0.824%	48.2
m-xylene	0.030%	110.8
p-xylene	0.030%	101.0
octane	0.201%	45.3
heptane	0.432%	49.4
nonane	0.131%	41.4
pentane	1.699%	39.5
unspeciated	1.869%	51.3
1,2,4-trimethylbenzene	0.010%	127.8

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

129 Cars, catalyst, urban driving

Profile No 109 but with benzene and butadiene numbers calculated from NAEI estimates

Profile No 109 but with benzene and butadiene numbers calculated from NAEI estimates

Species	*% of total NMVOC*	*POCP*
2-methylbutane	6.810%	40.5
1-pentanal	0.010%	76.5
1-propanal	0.050%	79.8
2-methyl benzaldehyde	0.070%	-9.2
2-butene	1.420%	113.9
1-pentene	0.110%	97.7
2-butanone	0.050%	37.3
2-methylpropane	1.590%	30.7
3-methylheptane	0.540%	45.0
2-methylhexane	1.480%	41.1
2-methylheptane	0.570%	44.6
3-methyl benzaldehyde	0.130%	-9.2
2-pentene	0.340%	111.9
3-methylhexane	1.140%	36.4
2-methylpropenal	0.050%	82.9
4-methyl benzaldehyde	0.060%	-9.2
2-methylpropene	2.220%	62.7
benzene	5.610%	21.8
ethylene	7.300%	100.0
C10 alkanes	0.587%	38.7
butane	5.240%	35.2
ethylbenzene	1.890%	73.0
acetaldehyde	0.750%	64.1
ethane	3.190%	12.3
dimethylhexene	0.150%	93.7
C10 aromatic hydrocarbons	3.070%	132.0
C13+ aromatic hydrocarbons	3.460%	128.3
decane	0.190%	38.4
benzaldehyde	0.220%	-9.2
crotonaldehyde	0.040%	70.0
C12 alkanes	0.587%	35.7
acetylene	2.810%	8.5
C11 alkanes	0.587%	36.4
C9 aromatic hydrocarbons	4.210%	98.6
acrolein	0.190%	73.0

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Cars, catalyst, urban driving

C13+ alkanes	1.450%	31.7
acetone	0.610%	9.4
toluene	10.980%	63.7
p-xylene	2.367%	101.0
heptane	0.740%	49.4
m-xylene	3.063%	110.8
propylene	3.820%	112.3
formaldehyde	1.700%	51.9
octane	0.530%	45.3
pentane	2.150%	39.5
nonane	0.160%	41.4
propane	0.650%	17.6
hexane	1.610%	48.2
propyne	0.080%	74.6
styrene	1.010%	14.2
o-xylene	2.260%	105.3
propadiene	0.050%	84.7
unspeciated	0.350%	51.3
unspeciated cycloalkanes	1.140%	43.4
1-hexene	0.170%	87.4
1,2,3-trimethylbenzene	0.860%	126.7
1-butene	0.730%	107.9
1,3-butadiene	0.910%	85.1
1-butyne	0.210%	73.2
1,2,4-trimethylbenzene	4.210%	127.8
1-butanal	0.050%	79.5
1,3,5-trimethylbenzene	1.420%	138.1

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

130 Cars, catalyst, motorway driving

Profile No 109 but with benzene and butadiene numbers calculated from NAEI estimates

Profile No 109 but with benzene and butadiene numbers calculated from NAEI estimates

Species	*% of total NMVOC*	*POCP*
2-butanone	0.050%	37.3
2-methyl benzaldehyde	0.070%	-9.2
2-methylbutane	6.810%	40.5
1-pentene	0.110%	97.7
1-pentanal	0.010%	76.5
1-propanal	0.050%	79.8
2-butene	1.420%	113.9
2-methylpropenal	0.050%	82.9
2-methylhexane	1.480%	41.1
4-methyl benzaldehyde	0.060%	-9.2
3-methylhexane	1.140%	36.4
3-methyl benzaldehyde	0.130%	-9.2
3-methylheptane	0.540%	45.0
2-methylheptane	0.570%	44.6
2-pentene	0.340%	111.9
2-methylpropene	2.220%	62.7
2-methylpropane	1.590%	30.7
ethylene	7.300%	100.0
acetone	0.610%	9.4
C13+ alkanes	1.450%	31.7
C11 alkanes	0.587%	36.4
benzaldehyde	0.220%	-9.2
C12 alkanes	0.587%	35.7
ethane	3.190%	12.3
ethylbenzene	1.890%	73.0
butane	5.240%	35.2
acetaldehyde	0.750%	64.1
C13+ aromatic hydrocarbons	3.460%	128.3
C9 aromatic hydrocarbons	4.210%	98.6
crotonaldehyde	0.040%	70.0
dimethylhexene	0.150%	93.7
acetylene	2.810%	8.5
C10 aromatic hydrocarbons	3.070%	132.0
acrolein	0.190%	73.0
decane	0.190%	38.4

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Cars, catalyst, motorway driving

benzene	5.610%	21.8
C10 alkanes	0.587%	38.7
propadiene	0.050%	84.7
toluene	10.980%	63.7
pentane	2.150%	39.5
heptane	0.740%	49.4
propyne	0.080%	74.6
m-xylene	3.063%	110.8
propylene	3.820%	112.3
styrene	1.010%	14.2
octane	0.530%	45.3
o-xylene	2.260%	105.3
propane	0.650%	17.6
hexane	1.610%	48.2
formaldehyde	1.700%	51.9
p-xylene	2.367%	101.0
nonane	0.160%	41.4
unspeciated	0.350%	51.3
unspeciated cycloalkanes	1.140%	43.4
1-butanal	0.050%	79.5
1,3-butadiene	0.910%	85.1
1-butyne	0.210%	73.2
1,3,5-trimethylbenzene	1.420%	138.1
1-butene	0.730%	107.9
1,2,3-trimethylbenzene	0.860%	126.7
1-hexene	0.170%	87.4
1,2,4-trimethylbenzene	4.210%	127.8

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

131 Cars, catalyst, rural driving

Profile No 109 but with benzene and butadiene numbers calculated from NAEI estimates

Profile No 109 but with benzene and butadiene numbers calculated from NAEI estimates

Species	*% of total NMVOC*	*POCP*
2-methyl benzaldehyde	0.070%	-9.2
2-butene	1.420%	113.9
2-methylbutane	6.810%	40.5
1-pentanal	0.010%	76.5
1-pentene	0.110%	97.7
1-propanal	0.050%	79.8
2-butanone	0.050%	37.3
2-pentene	0.340%	111.9
2-methylpropane	1.590%	30.7
2-methylhexane	1.480%	41.1
3-methyl benzaldehyde	0.130%	-9.2
3-methylhexane	1.140%	36.4
3-methylheptane	0.540%	45.0
2-methylheptane	0.570%	44.6
4-methyl benzaldehyde	0.060%	-9.2
2-methylpropene	2.220%	62.7
2-methylpropenal	0.050%	82.9
ethane	3.190%	12.3
C12 alkanes	0.587%	35.7
dimethylhexene	0.150%	93.7
benzaldehyde	0.220%	-9.2
decane	0.190%	38.4
acetylene	2.810%	8.5
acrolein	0.190%	73.0
crotonaldehyde	0.040%	70.0
butane	5.240%	35.2
acetone	0.610%	9.4
ethylbenzene	1.890%	73.0
C11 alkanes	0.587%	36.4
C9 aromatic hydrocarbons	4.210%	98.6
C10 alkanes	0.587%	38.7
acetaldehyde	0.750%	64.1
C10 aromatic hydrocarbons	3.070%	132.0
benzene	5.610%	21.8
C13+ alkanes	1.450%	31.7

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Cars, catalyst, rural driving

ethylene	7.300%	100.0
C13+ aromatic hydrocarbons	3.460%	128.3
o-xylene	2.260%	105.3
propadiene	0.050%	84.7
pentane	2.150%	39.5
propane	0.650%	17.6
formaldehyde	1.700%	51.9
heptane	0.740%	49.4
styrene	1.010%	14.2
nonane	0.160%	41.4
p-xylene	2.367%	101.0
propyne	0.080%	74.6
m-xylene	3.063%	110.8
hexane	1.610%	48.2
toluene	10.980%	63.7
propylene	3.820%	112.3
octane	0.530%	45.3
unspeciated	0.350%	51.3
unspeciated cycloalkanes	1.140%	43.4
1,2,3-trimethylbenzene	0.860%	126.7
1-hexene	0.170%	87.4
1-butene	0.730%	107.9
1-butyne	0.210%	73.2
1,3,5-trimethylbenzene	1.420%	138.1
1,2,4-trimethylbenzene	4.210%	127.8
1-butanal	0.050%	79.5
1,3-butadiene	0.910%	85.1

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

132 Cars, catalyst, cold start

Profile No 109 but with benzene and butadiene numbers calculated from NAEI estimates

Profile No 109 but with benzene and butadiene numbers calculated from NAEI estimates

Species	*% of total NMVOC*	*POCP*
2-butene	1.420%	113.9
2-methyl benzaldehyde	0.070%	-9.2
1-pentene	0.110%	97.7
1-pentanal	0.010%	76.5
2-methylbutane	6.810%	40.5
2-butanone	0.050%	37.3
1-propanal	0.050%	79.8
4-methyl benzaldehyde	0.060%	-9.2
3-methylheptane	0.540%	45.0
2-methylpropane	1.590%	30.7
3-methylhexane	1.140%	36.4
2-pentene	0.340%	111.9
2-methylpropenal	0.050%	82.9
2-methylheptane	0.570%	44.6
2-methylhexane	1.480%	41.1
3-methyl benzaldehyde	0.130%	-9.2
2-methylpropene	2.220%	62.7
ethylbenzene	1.890%	73.0
acetylene	2.810%	8.5
acrolein	0.190%	73.0
acetone	0.610%	9.4
C11 alkanes	0.587%	36.4
benzaldehyde	0.220%	-9.2
C9 aromatic hydrocarbons	4.210%	98.6
C10 alkanes	0.587%	38.7
C10 aromatic hydrocarbons	3.070%	132.0
C13+ aromatic hydrocarbons	3.460%	128.3
decane	0.190%	38.4
C13+ alkanes	1.450%	31.7
crotonaldehyde	0.040%	70.0
butane	5.240%	35.2
C12 alkanes	0.587%	35.7
ethylene	7.300%	100.0
dimethylhexene	0.150%	93.7
ethane	3.190%	12.3

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Cars, catalyst, cold start

acetaldehyde	0.750%	64.1
benzene	5.610%	21.8
p-xylene	2.367%	101.0
formaldehyde	1.700%	51.9
octane	0.530%	45.3
propane	0.650%	17.6
nonane	0.160%	41.4
hexane	1.610%	48.2
o-xylene	2.260%	105.3
toluene	10.980%	63.7
heptane	0.740%	49.4
m-xylene	3.063%	110.8
propadiene	0.050%	84.7
pentane	2.150%	39.5
propyne	0.080%	74.6
propylene	3.820%	112.3
styrene	1.010%	14.2
unspeciated	0.350%	51.3
unspeciated cycloalkanes	1.140%	43.4
1-butyne	0.210%	73.2
1-hexene	0.170%	87.4
1-butanal	0.050%	79.5
1-butene	0.730%	107.9
1,3,5-trimethylbenzene	1.420%	138.1
1,2,3-trimethylbenzene	0.860%	126.7
1,2,4-trimethylbenzene	4.210%	127.8
1,3-butadiene	0.910%	85.1

135 Blast furnaces

Based on US EPA profile No 0013 (83% of total) + unspeciated (17%)

Based on US EPA profile No 0013 (83% of total) + unspeciated (17%)

Species	*% of total NMVOC*	*POCP*
ethane	9.326%	12.3
ethylene	18.341%	100.0
acetylene	46.007%	8.5
propylene	9.326%	112.3
unspeciated	17.000%	51.3

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

136 Press washups

Average of white spirit and SBP solvents (profiles 66 and 118)

Average of white spirit and SBP solvents (profiles 66 and 118)

Species	*% of total NMVOC*	*POCP*
2,2-dimethylpentane	0.562%	38.6
2,3-dimethylpentane	0.562%	39.1
1-methyl-2-isopropylbenzene	0.204%	88.4
2,3,3,4-tetramethylpentane	0.005%	37.2
2,3-dimethyloctane	0.086%	40.2
2,3,4-trimethylhexane	0.021%	42.9
2-ethyl-1,3-dimethylbenzene	0.260%	114.6
2,5-dimethyloctane	0.342%	40.2
1-methyl-4-isopropylcyclohexane	0.845%	43.0
2,3-dimethylundecane	0.048%	31.7
1-methylindan	0.060%	80.0
2,6-dimethyldecane	0.134%	35.1
2,2,5-trimethylhexane	0.021%	37.6
2,5-dimethylheptane	0.128%	51.2
2,4-dimethyl-1-(1-methylethyl)benzene	0.160%	111.7
2,4-dimethylheptane	0.043%	42.6
1-methyl-4-tertbutylbenzene	0.136%	87.3
1-methylbutylbenzene	0.132%	105.7
2,4-dimethylpentane	0.562%	46.6
2,5-dimethyldecane	0.107%	34.6
2-methyl-5-ethyloctane	0.284%	38.0
1-methyl-1-propylcyclopentane	0.123%	37.9
2,5-dimethylhexane	0.005%	44.6
2,6-dimethylundecane	0.032%	31.7
1-methyl-3-(isopropyl)benzene	0.240%	104.1
2-methyldecalin	0.198%	41.4
2-methyl-1-butylbenzene	0.016%	86.2
2,3-dimethylheptane	0.273%	42.6
1-methyl-3-isopropylcyclopentane	0.005%	39.1
2,7-dimethyloctane	0.203%	39.9
1-methyl-3-propylbenzene	0.476%	104.1
2,6-dimethylheptane	0.139%	42.3
1-methyl-2-propylbenzene	0.240%	88.4
1-methylindene	0.005%	136.2
2,3-dimethylnonane	0.203%	37.7
2,3-dimethylbutane	0.500%	54.1

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Press washups

2,2,3,3-tetramethylhexane	0.321%	19.2
1-methyl-4-isopropylbenzene	0.816%	89.6
2-methyldecane	0.813%	37.5
2,6-dimethyloctane	1.022%	40.2
2,3,5-trimethylhexane	0.005%	42.6
4,4-dimethylheptane	0.011%	37.2
2-methylnonane	1.091%	39.9
2-methylheptane	0.043%	44.6
3-ethyl-2-methylhexane	0.021%	43.1
3-methylnonane	1.263%	40.2
3-methylpentane	4.500%	47.9
4-methylnonane	0.861%	40.2
3-methylheptane	0.032%	45.0
3-ethylheptane	0.273%	43.1
2-methylhexane	4.000%	41.1
3-ethyl-2-methylheptane	1.236%	39.9
3,6-dimethyloctane	0.251%	40.5
5-methyldecane	0.412%	37.7
3,7-dimethylnonane	0.284%	37.9
4,5-dimethylnonane	0.198%	37.9
3-methyldecane	0.915%	37.7
3-methyloctane	0.337%	42.6
4-methyldecane	1.530%	37.7
4-ethyloctane	0.096%	44.4
3,3-dimethylheptane	0.032%	37.2
2-methylpentane	5.000%	42.0
4-methyloctane	0.385%	42.3
3,3-dimethyloctane	0.289%	35.8
3-methylundecane	0.155%	35.1
3,3,5-trimethylheptane	0.027%	36.2
5-methylundecane	0.128%	35.1
4,6-dimethylindan	0.020%	132.5
3,4-dimethylheptane	0.337%	42.6
3,3,4-trimethylhexane	0.005%	37.6
3,4-dimethylhexane	0.005%	45.3
3-ethyloctane	0.214%	44.4
3-methylhexane	4.005%	36.4
6-ethyl-2-methyldecane	0.016%	32.8
4-propylheptane	0.016%	40.5

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Press washups

4-methylheptane	0.016%	45.0
3,3-dimethylpentane	0.562%	37.8
3,5-dimethyloctane	0.091%	40.5
2-methylundecane	0.134%	35.2
2-methyloctane	0.375%	42.8
4-ethyl-1,2-dimethylbenzene	0.176%	114.6
4-ethyltoluene	0.304%	90.6
3-ethyltoluene	0.732%	101.9
3-ethylhexane	0.005%	41.5
4,7-dimethylindan	0.008%	132.5
cycloheptane	0.005%	53.4
decane	5.024%	38.4
butylcyclohexane	0.802%	42.5
C9 cycloalkanes	0.053%	41.4
C9 alkanes	0.053%	40.4
C10 alkanes	0.754%	38.7
ethylisopropylbenzene	0.008%	105.7
C11 alkanes	0.883%	36.4
C10 cycloalkanes	0.952%	38.4
ethylbenzene	0.116%	73.0
C11 cycloalkanes	0.064%	38.4
C11 aromatic hydrocarbons	0.008%	134.2
C13 alkanes	0.005%	31.7
6-ethyl-2-methyloctane	0.048%	38.0
C12 cycloalkanes	0.027%	35.7
C12 alkanes	0.284%	35.7
C8 alkanes	0.005%	42.2
6-methylundecane	0.102%	35.1
ethylcyclohexane	0.289%	48.3
dimethylcyclopentane	2.250%	45.8
decalin	0.278%	44.4
dimethylnonane	0.107%	38.4
cyclohexane	4.750%	29.0
dodecane	0.305%	35.7
butylbenzene	0.208%	69.0
octane	0.209%	45.3
isopentylbenzene	0.032%	67.3
tert-butylcyclopropane	0.005%	11.5
p-xylene	0.096%	101.0

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Press washups

hexane	13.000%	48.2
nonane	2.900%	41.4
o-xylene	0.276%	105.3
m-xylene	0.104%	110.8
hexylcyclohexane	0.005%	36.7
toluene	0.032%	63.7
naphthalene	0.028%	97.7
methylcyclohexane	1.800%	51.0
methyltetralin	0.012%	114.0
propylcyclopentane	0.005%	44.5
propylcyclohexane	1.043%	45.4
undecane	2.627%	38.4
methylcyclodecane	0.043%	39.3
isopropylbenzene	0.200%	50.0
pentylbenzene	0.008%	67.3
pentylcyclohexane	0.198%	39.6
indan	0.184%	79.7
octahydroindan	0.144%	44.5
propylbenzene	0.456%	63.6
heptane	4.761%	49.4
tetramethylcyclohexane	0.155%	38.5
methylcyclopentane	3.250%	48.1
tert-pentylbenzene	0.080%	67.3
unspeciated	0.062%	51.3
unspeciated hydrocarbons	0.267%	71.9
unspeciated cycloalkanes	0.032%	43.4
unspeciated alkanes	0.064%	36.8
1,2,4,5-tetramethylbenzene	0.100%	114.6
(1-methylethyl)cyclohexane	0.487%	40.5
1-ethyl-1,4-dimethylcyclohexane	0.096%	38.7
1-ethyl-2,2,6-trimethylcyclohexane	0.246%	37.2
1-ethyl-2,3-dimethylbenzene	0.164%	114.6
1-ethyl-2,3-dimethylcyclohexane	0.112%	42.3
1-ethyl-2-propylbenzene	0.052%	86.2
1-ethyl-2-propylcyclohexane	0.102%	40.0
1-ethyl-3,5-dimethylbenzene	0.224%	136.0
1,3-diethylbenzene	0.200%	104.1
1-ethyl-4-methylcyclohexane	0.310%	45.6
(2-methylpropyl)cyclohexane	0.476%	42.7

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Press washups

1-ethylpropylbenzene	0.060%	105.7
1,1,4,4-tetramethylcyclohexane	0.139%	34.3
1,2,4,4-tetramethylcyclopentane	0.037%	37.5
1,1,3-trimethylcyclohexane	0.225%	41.2
1,2,3-trimethylcyclopentane	0.011%	43.6
1,2,3-trimethylcyclohexane	0.412%	45.4
1,2,3-trimethylbenzene	0.624%	126.7
1-methyl-1-phenylcyclopropane	0.044%	63.7
1-ethyl-3-methylcyclohexane	0.728%	45.6
(2-methylbutyl)cyclohexane	0.064%	39.8
1,4-dimethylcyclohexane	0.230%	48.2
1,4-diethylbenzene	0.204%	89.6
1,3-ethylmethylcyclopentane	0.011%	44.2
(1-methylpropyl)cyclohexane	0.877%	38.5
1,3-dimethylcyclohexane	0.091%	48.2
1,3-dimethyl-5-propylbenzene	0.024%	132.5
1,3-dimethyl-4-ethylbenzene	0.200%	114.6
1,2,3,4-tetramethylbenzene	0.108%	114.6
1,1,2-trimethylcyclohexane	0.198%	41.2
1,2,4-trimethlycyclopentane	0.005%	43.6
1,3,5-trimethylbenzene	0.696%	138.1
1,2,3,5-tetramethylcyclohexane	0.219%	42.7
1,2-ethylmethylcyclopentane	0.016%	44.2
1,2-dimethylcyclohexane	0.102%	48.2
1,2-dimethyl-3-isopropylcyclopentane	0.075%	39.3
1,2,4-trimethylcyclohexane	0.128%	45.4
1,2,4-trimethylbenzene	1.440%	127.8
1,2,3,5-tetramethylbenzene	0.136%	136.0
1,1-dimethylcyclohexane	0.016%	42.8
1,4-dimethyl-2-isopropylbenzene	0.032%	111.7
1,2,3,4-tetrahydronaphthalene	0.084%	115.1

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

137 Solvent use: Bisol K

Data from solvent supplier

Data from solvent supplier

Species	*% of total NMVOC*	*POCP*
2-butanone	28.000%	37.3
2-propyl acetate	8.000%	21.1
3-pentanone	24.000%	41.4
4-methyl-2-pentanone	3.000%	49.0
acetone	20.000%	9.4
ethyl acetate	12.000%	20.9
propyl acetate	5.000%	28.2

138 Printing - overprint varnishes

Average of SBP solvents, toluene, 2-butanone, 2-propanol & 2-ethoxyethanol

Average of SBP solvents, toluene, 2-butanone, 2-propanol & 2-ethoxyethanol

Species	*% of total NMVOC*	*POCP*
2,3-dimethylbutane	0.200%	54.1
2,3-dimethylpentane	0.225%	39.1
2-ethoxyethanol	20.000%	38.6
2,2-dimethylpentane	0.225%	38.6
2-butanone	20.000%	37.3
2,4-dimethylpentane	0.225%	46.6
3-methylpentane	1.800%	47.9
3,3-dimethylpentane	0.225%	37.8
2-methylpentane	2.000%	42.0
2-propanol	20.000%	18.8
3-methylhexane	1.600%	36.4
2-methylhexane	1.600%	41.1
dimethylcyclopentane	0.900%	45.8
cyclohexane	1.900%	29.0
methylcyclopentane	1.300%	48.1
methylcyclohexane	0.700%	51.0
heptane	1.900%	49.4
toluene	20.000%	63.7
hexane	5.200%	48.2

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

139 Solvent use: Shellsol D70

Data from solvent supplier

Data from solvent supplier

Species	*% of total NMVOC*	*POCP*
C11 cycloalkanes	10.000%	38.4
C10 cycloalkanes	4.000%	38.4
C14 cycloalkanes	8.000%	30.7
C12 cycloalkanes	11.000%	35.7
C13 alkanes	11.000%	31.7
C13 cycloalkanes	14.000%	31.7
C11 alkanes	9.000%	36.4
C12 alkanes	16.000%	35.7
C10 alkanes	3.000%	38.7
C15 alkanes	3.000%	28.4
C15 cycloalkanes	4.000%	28.4
C14 alkanes	7.000%	30.7

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

140 Aerosols

Based on BAMA and SIA data - see naei00/rawdata/datafrmt/voc/species/aerosols00

Based on BAMA and SIA data - see naei00/rawdata/datafrmt/voc/species/aerosols_00.xls

Species	*% of total NMVOC*	*POCP*
dimethyl ether	1.636%	18.9
ethanol	28.037%	39.9
pentane	0.514%	39.5
1-propanol	1.752%	56.1
1-ethyl-2-propylbenzene	0.009%	86.2
1,2,4,4-tetramethylcyclopentane	0.006%	37.5
1,2-dimethylcyclohexane	0.017%	48.2
1,2,4,5-tetramethylbenzene	0.017%	114.6
1,2-ethylmethylcyclopentane	0.003%	44.2
1,3,5-trimethylbenzene	0.117%	138.1
1-ethyl-2,3-dimethylcyclohexane	0.019%	42.3
acetone	0.146%	9.4
2-butanone	0.438%	37.3
1,1,1-trichloroethane	2.336%	0.9
(1-methylethyl)cyclohexane	0.082%	40.5
(1-methylpropyl)cyclohexane	0.148%	38.5
1-ethyl-2-propylcyclohexane	0.017%	40.0
1,3-dimethyl-5-propylbenzene	0.004%	132.5
1,3-dimethylcyclohexane	0.015%	48.2
ethyl acetate	0.584%	20.9
1,2,3,4-tetramethylbenzene	0.018%	114.6
(2-methylpropyl)cyclohexane	0.080%	42.7
1,1,2-trimethylcyclohexane	0.033%	41.2
1,1,3-trimethylcyclohexane	0.038%	41.2
1,1,4,4-tetramethylcyclohexane	0.023%	34.3
1,2,4-trimethylbenzene	0.242%	127.8
1-ethyl-2,2,6-trimethylcyclohexane	0.041%	37.2
1,2,4-trimethylcyclohexane	0.022%	45.4
1-ethyl-1,4-dimethylcyclohexane	0.016%	38.7
1,4-dimethylcyclohexane	0.039%	48.2
1,4-dimethyl-2-isopropylbenzene	0.005%	111.7
1,3-dimethyl-4-ethylbenzene	0.034%	114.6
1,3-diethylbenzene	0.034%	104.1
1,2,3-trimethylcyclopentane	0.002%	43.6
1,4-diethylbenzene	0.034%	89.6

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Aerosols

1,1-dimethylcyclohexane	0.003%	42.8
1,2,3,5-tetramethylbenzene	0.023%	136.0
1,2,3-trimethylbenzene	0.105%	126.7
1,2,3,5-tetramethylcyclohexane	0.037%	42.7
1,2,3-trimethylcyclohexane	0.069%	45.4
1-ethyl-3-methylcyclohexane	0.122%	45.6
1-ethyl-2,3-dimethylbenzene	0.028%	114.6
1-ethyl-3,5-dimethylbenzene	0.038%	136.0
1,2,4-trimethlycyclopentane	0.001%	43.6
(2-methylbutyl)cyclohexane	0.011%	39.8
2-propanol	5.257%	18.8
1,2,3,4-tetrahydronaphthalene	0.014%	115.1
1,3-ethylmethylcyclopentane	0.002%	44.2
1,2-dimethyl-3-isopropylcyclopentane	0.013%	39.3
1-ethylpropylbenzene	0.010%	105.7
C9 alkanes	0.009%	40.4
C9 cycloalkanes	0.009%	41.4
cycloheptane	0.001%	53.4
C8 alkanes	0.001%	42.2
C11 cycloalkanes	0.011%	38.4
1-methyl-3-propylbenzene	0.080%	104.1
C12 alkanes	0.048%	35.7
1-methyl-3-isopropylcyclopentane	0.001%	39.1
1-methyl-3-(isopropyl)benzene	0.040%	104.1
C11 aromatic hydrocarbons	0.001%	134.2
1-methyl-2-propylbenzene	0.040%	88.4
1-methyl-2-isopropylbenzene	0.034%	88.4
1-methyl-1-phenylcyclopropane	0.007%	63.7
1-methyl-1-propylcyclopentane	0.021%	37.9
2,7-dimethyloctane	0.034%	39.9
1-ethyl-4-methylcyclohexane	0.052%	45.6
C13 alkanes	0.001%	31.7
C12 cycloalkanes	0.005%	35.7
3-methyloctane	0.057%	42.6
3-ethyl-2-methylhexane	0.004%	43.1
3-ethylheptane	0.046%	43.1
3-ethylhexane	0.001%	41.5
3-ethyloctane	0.036%	44.4
3-ethyltoluene	0.123%	101.9

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Aerosols

3-methyldecane	0.154%	37.7
3-methylheptane	0.005%	45.0
2,5-dimethyloctane	0.058%	40.2
3-methylnonane	0.212%	40.2
3,6-dimethyloctane	0.042%	40.5
3-methylundecane	0.026%	35.1
4,4-dimethylheptane	0.002%	37.2
4,5-dimethylnonane	0.033%	37.9
4,6-dimethylindan	0.003%	132.5
2,6-dimethylundecane	0.005%	31.7
2,6-dimethylheptane	0.023%	42.3
2,6-dimethyloctane	0.172%	40.2
3-methylhexane	0.001%	36.4
3,3,4-trimethylhexane	0.001%	37.6
2-methyl-5-ethyloctane	0.048%	38.0
2-methyldecalin	0.033%	41.4
2-methyldecane	0.137%	37.5
2-methyl-1-butylbenzene	0.003%	86.2
2-methylheptane	0.007%	44.6
2-methylnonane	0.184%	39.9
2-ethyl-1,3-dimethylbenzene	0.044%	114.6
3-ethyl-2-methylheptane	0.208%	39.9
2-methylundecane	0.022%	35.2
3,7-dimethylnonane	0.048%	37.9
3,3,5-trimethylheptane	0.005%	36.2
3,3-dimethylheptane	0.005%	37.2
3,3-dimethyloctane	0.049%	35.8
3,4-dimethylheptane	0.057%	42.6
decalin	0.047%	44.4
3,4-dimethylhexane	0.001%	45.3
3,5-dimethyloctane	0.015%	40.5
2,5-dimethylhexane	0.001%	44.6
2-methyloctane	0.063%	42.8
1-methylindan	0.010%	80.0
4-methylnonane	0.145%	40.2
4-methyloctane	0.065%	42.3
4-propylheptane	0.003%	40.5
5-methyldecane	0.069%	37.7
5-methylundecane	0.022%	35.1

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Aerosols

6-ethyl-2-methyldecane	0.003%	32.8
6-ethyl-2-methyloctane	0.008%	38.0
2,6-dimethyldecane	0.022%	35.1
butylbenzene	0.035%	69.0
2,2,3,3-tetramethylhexane	0.054%	19.2
1-methylbutylbenzene	0.022%	105.7
1-methyl-4-tertbutylbenzene	0.023%	87.3
1-methyl-4-isopropylcyclohexane	0.142%	43.0
1-methyl-4-isopropylbenzene	0.137%	89.6
butylcyclohexane	0.135%	42.5
C10 alkanes	0.127%	38.7
C10 cycloalkanes	0.160%	38.4
6-methylundecane	0.017%	35.1
2,3-dimethylundecane	0.008%	31.7
2,5-dimethylheptane	0.022%	51.2
2,5-dimethyldecane	0.018%	34.6
2,4-dimethylheptane	0.007%	42.6
2,4-dimethyl-1-(1-methylethyl)benzene	0.027%	111.7
4,7-dimethylindan	0.001%	132.5
4-ethyl-1,2-dimethylbenzene	0.030%	114.6
4-ethyloctane	0.016%	44.4
4-methylheptane	0.003%	45.0
4-methyldecane	0.257%	37.7
1-methylindene	0.001%	136.2
2,3-dimethyloctane	0.014%	40.2
2,3-dimethylnonane	0.034%	37.7
2,3-dimethylheptane	0.046%	42.6
2,3,5-trimethylhexane	0.001%	42.6
2,3,4-trimethylhexane	0.004%	42.9
2,3,3,4-tetramethylpentane	0.001%	37.2
2,2,5-trimethylhexane	0.004%	37.6
C11 alkanes	0.149%	36.4
4-ethyltoluene	0.051%	90.6
m-xylene	0.017%	110.8
methylcyclodecane	0.007%	39.3
dimethylnonane	0.018%	38.4
tetramethylcyclohexane	0.026%	38.5
toluene	0.005%	63.7
dodecane	0.051%	35.7

NMVOC Speciation Profiles compiled for the UK National Atmospheric Emissions Inventory

Aerosols

ethylbenzene	0.020%	73.0
unspeciated	0.010%	51.3
isopropylbenzene	0.034%	50.0
ethylcyclohexane	0.049%	48.3
heptane	0.002%	49.4
unspeciated alkanes	0.011%	36.8
ethylisopropylbenzene	0.001%	105.7
unspeciated cycloalkanes	0.005%	43.4
unspeciated hydrocarbons	0.045%	71.9
methylcyclohexane	0.008%	51.0
undecane	0.442%	38.4
methyltetralin	0.002%	114.0
p-xylene	0.016%	101.0
pentylbenzene	0.001%	67.3
pentylcyclohexane	0.033%	39.6
propylbenzene	0.077%	63.6
octahydroindan	0.024%	44.5
o-xylene	0.046%	105.3
tert-butylcyclopropane	0.001%	11.5
naphthalene	0.005%	97.7
isopentylbenzene	0.005%	67.3
propylcyclohexane	0.176%	45.4
propylcyclopentane	0.001%	44.5
octane	0.035%	45.3
hexylcyclohexane	0.001%	36.7
tert-pentylbenzene	0.013%	67.3
decane	0.845%	38.4
indan	0.031%	79.7
nonane	0.488%	41.4
propane	7.633%	17.6
butane	43.255%	35.2

Appendix 2
Common glycol ethers and glycol acetates

The following list of glycol ethers and glycol acetates is based on inclusion in a SIA publication - 'Solvents – A Guide to Safe Handling', published in 1988. The list has been used in a number of species profiles where glycol ethers and acetates are known to be used, but where individual solvents have not been identified. It is recommended that the SIA be contacted regarding the current market for glycol ethers and acetates so that the list can be replaced by more accurate data.

1-methoxy-2-propyl acetate
2-methoxyethyl acetate
2-(2-butoxyethoxy)ethyl acetate
2-butoxyethyl acetate
2-ethoxyethyl acetate
2-(2-ethoxyethoxy)ethyl acetate
1-ethoxy-2-propyl acetate
2-butoxyethanol
2-ethoxyethanol
2-methoxyethanol
2-(methoxyethoxy)ethanol
2-isopropoxyethanol
2-(2-ethoxyethoxy)ethanol
2-[2-(2-ethoxy-ethoxy)-ethoxy]-ethanol
1-ethoxy-2-propanol
1-methoxy-2-propanol
2-(2-butoxyethoxy)ethanol
1-(2-ethoxy-1-methyl-ethoxy)-2-propanol
1-(2-methoxy-1-methyl-ethoxy)-2-propanol

Appendix 3
Species Profiles for Solvent Mixtures

The following species profiles have been used for solvents, which are mixtures of compounds. The profiles have been provided by solvent suppliers.

Profile No. 116	SBP 65/70	Table A3.1
Profile No. 117	SBP 80/110	Table A3.1
Profile No. 118	SBP solvent (average)	Table A3.1
Profile No. 119	Aromatic solvent 160-180°C	Table A3.2
Profile No. 120	Aromatic solvent 180-220°C	Table A3.2
Profile No. 121	Solvent xylene	Table A3.3
Profile No. 137	Bisol K	Table A3.4
Profile No 140	Shellsol D70	Table A3.5
Profile No. 66	White spirit	Table A3.6

A number of other solvent mixtures require speciation, for example de-aromatised white spirit, and other grades of SBP solvent.

Table A3.1 Composition of SBP solvents

Component	SBP 65/70	SBP 80/110	50/50 mixture
2,3-dimethyl butane	2%		1%
2-methyl pentane	20%		10%
3-methyl pentane	18%		9%
n-hexane	49%	3%	26%
methylcyclopentane	8%	5%	6.5%
cyclohexane	3%	16%	9.5%
dimethylpentanes		9%	4.5%
methylhexanes		32%	16%
n- heptane		19%	9.5%
dimethylcyclopentane		9%	4.5%
methylcyclohexane		7%	3.5%

The profile for a 50/50 mixture of the two SBP solvents has been calculated for use where no information is available on the type of SBP solvent used.

Table A3.2 Composition of aromatic hydrocarbon solvents

Component	160-180°C b.p.	180-220°C b.p.
propyl benzene	4%	
methyl ethyl benzene	30%	4%
1,3,5-trimethyl benzene	8%	2%
1,2,4-trimethyl benzene	31%	11%
1,2,3-trimethyl benzene	7%	6%
diethyl benzene	2%	2%
methyl propyl benzene	4%	9%
ethyl dimethyl benzene	7%	25%
indane		2%
1,2,4,5-tetramethyl benzene	0.67%	7%
1,2,3,5-tetramethyl benzene	0.67%	11%
1,2,3,4-tetramethyl benzene	0.67%	4%
methyl indane		4%
naphthalene		5%
unspeciated aromatic hydrocarbons	5%	8%

Table A3.3 Composition of Bisol K

Component	%
acetone	20%
ethyl acetate	12%
2-propyl acetate	8%
propyl acetate	5%
2-butanone	28%
4-methyl-2-pentanone	3%
3-pentanone	24%

Table A3.4 Composition of solvent xylene

Component	%
Ethylbenzene	20%
o-xylene	12%
m-xylene	55%
p-xylene	13%

Table A3.5 Composition of Shellsol D70

Number of carbon atoms	alkanes	cycloalkanes
10	3%	4%
11	9%	10%
12	16%	11%
13	11%	14%
14	7%	8%
15	3%	4%

Table A3.6 Composition of white spirit

species	%	species	%
(1-methylethyl)cyclohexane	0.974	3,3-dimethylheptane	0.064
(1-methylpropyl)cyclohexane	1.755	3,3-dimethyloctane	0.578
(2-methylbutyl)cyclohexane	0.128	3,4-dimethylheptane	0.674
(2-methylpropyl)cyclohexane	0.952	3,4-dimethylhexane	0.011
1,1,2-trimethylcyclohexane	0.396	3,5-dimethyloctane	0.182
1,1,3-trimethylcyclohexane	0.449	3,6-dimethyloctane	0.503
1,1,4,4-tetramethylcyclohexane	0.278	3,7-dimethylnonane	0.567
1,1-dimethylcyclohexane	0.032	3-ethyl-2-methylheptane	2.472
1,2,3,4-tetrahydronaphthalene	0.168	3-ethyl-2-methylhexane	0.043
1,2,3,4-tetramethylbenzene	0.216	3-ethylheptane	0.546
1,2,3,5-tetramethylbenzene	0.272	3-ethylhexane	0.011
1,2,3,5-tetramethylcyclohexane	0.439	3-ethyloctane	0.428
1,2,3-trimethylbenzene	1.248	3-ethyltoluene	1.464
1,2,3-trimethylcyclohexane	0.824	3-methyldecane	1.830
1,2,3-trimethylcyclopentane	0.021	3-methylheptane	0.064
1,2,4,4-tetramethylcyclopentane	0.075	3-methylhexane	0.011
1,2,4,5-tetramethylbenzene	0.200	3-methylnonane	2.525
1,2,4-trimethlycyclopentane	0.011	3-methyloctane	0.674
1,2,4-trimethylbenzene	2.880	3-methylundecane	0.310
1,2,4-trimethylcyclohexane	0.257	4,4-dimethylheptane	0.021
1,2-dimethyl-3-isopropylcyclopentane	0.150	4,5-dimethylnonane	0.396
1,2-dimethylcyclohexane	0.203	4,6-dimethylindan	0.040
1,2-ethylmethylcyclopentane	0.032	4,7-dimethylindan	0.016
1,3,5-trimethylbenzene	1.392	4-ethyl-1,2-dimethylbenzene	0.352
1,3-diethylbenzene	0.400	4-ethyloctane	0.193
1,3-dimethyl-4-ethylbenzene	0.400	4-ethyltoluene	0.608
1,3-dimethyl-5-propylbenzene	0.048	4-methyldecane	3.060
1,3-dimethylcyclohexane	0.182	4-methylheptane	0.032
1,3-ethylmethylcyclopentane	0.021	4-methylnonane	1.723
1,4-diethylbenzene	0.408	4-methyloctane	0.770
1,4-dimethyl-2-isopropylbenzene	0.064	4-propylheptane	0.032
1,4-dimethylcyclohexane	0.460	5-methyldecane	0.824
1-ethyl-1,4-dimethylcyclohexane	0.193	5-methylundecane	0.257
1-ethyl-2,2,6-trimethylcyclohexane	0.492	6-ethyl-2-methyldecane	0.032
1-ethyl-2,3-dimethylbenzene	0.328	6-ethyl-2-methyloctane	0.096
1-ethyl-2,3-dimethylcyclohexane	0.225	6-methylundecane	0.203
1-ethyl-2-propylbenzene	0.104	butylbenzene	0.416
1-ethyl-2-propylcyclohexane	0.203	butylcyclohexane	1.605
1-ethyl-3,5-dimethylbenzene	0.448	C10 cycloalkanes	1.905
1-ethyl-3-methylcyclohexane	1.455	C10 alkanes	1.509
1-ethyl-4-methylcyclohexane	0.621	C11 aromatic hydrocarbons	0.016
1-ethylpropylbenzene	0.120	C11 cycloalkanes	0.128
1-methyl-1-phenylcyclopropane	0.088	C11 alkanes	1.766
1-methyl-1-propylcyclopentane	0.246	C9 alkanes	0.107
1-methyl-2-isopropylbenzene	0.408	C12 cycloalkanes	0.054

species	%	species	%
1-methyl-2-propylbenzene	0.480	C12 alkanes	0.567
1-methyl-3-(isopropyl)benzene	0.480	C13 alkanes	0.011
1-methyl-3-isopropylcyclopentane	0.011	C9 cycloalkanes	0.107
1-methyl-3-propylbenzene	0.952	unspeciated hydrocarbons	0.535
1-methyl-4-isopropylbenzene	1.632	cycloheptane	0.011
1-methyl-4-isopropylcyclohexane	1.691	decalin	0.556
1-methyl-4-tertbutylbenzene	0.272	decane	10.04
1-methylbutylbenzene	0.264	dimethylnonane	0.214
1-methylindan	0.120	dodecane	0.610
1-methylindene	0.011	ethylbenzene	0.232
2,2,3,3-tetramethylhexane	0.642	ethylcyclohexane	0.578
2,2,5-trimethylhexane	0.043	ethylisopropylbenzene	0.016
2,3,3,4-tetramethylpentane	0.011	heptane	0.021
2,3,4-trimethylhexane	0.043	hexylcyclohexane	0.011
2,3,5-trimethylhexane	0.011	indan	0.368
2,3-dimethylheptane	0.546	isopentylbenzene	0.064
2,3-dimethylnonane	0.407	isopropylbenzene	0.400
2,3-dimethyloctane	0.171	m-xylene	0.208
2,3-dimethylundecane	0.096	methylcyclodecane	0.086
2,4-dimethyl-1-(1-methylethyl)benzene	0.320	methylcyclohexane	0.096
2,4-dimethylheptane	0.086	methyltetralin	0.024
2,5-dimethyldecane	0.214	naphthalene	0.056
2,5-dimethylheptane	0.257	nonane	5.799
2,5-dimethylhexane	0.011	o-xylene	0.552
2,5-dimethyloctane	0.685	octahydroindan	0.289
2,6-dimethyldecane	0.268	octane	0.417
2,6-dimethylheptane	0.278	p-xylene	0.192
2,6-dimethyloctane	2.044	pentylbenzene	0.016
2,6-dimethylundecane	0.064	pentylcyclohexane	0.396
2,7-dimethyloctane	0.407	propylbenzene	0.912
2-ethyl-1,3-dimethylbenzene	0.520	propylcyclohexane	2.087
2-methyl-1-butylbenzene	0.032	propylcyclopentane	0.011
2-methyl-5-ethyloctane	0.567	tert-butylcyclopropane	0.011
2-methyldecalin	0.396	tert-pentylbenzene	0.160
2-methyldecane	1.626	tetramethylcyclohexane	0.310
2-methylheptane	0.086	toluene	0.064
2-methylnonane	2.183	undecane	5.254
2-methyloctane	0.749	C8 alkanes	0.011
2-methylundecane	0.268	unspeciated	0.123
3,3,4-trimethylhexane	0.011	unspeciated alkanes	0.128
3,3,5-trimethylheptane	0.054	unspeciated cycloalkanes	0.064

Appendix 4
Composite Profiles for SNAP level 1 codes

The composite profiles given below have been calculated from the 1999 NAEI and are based on the 1999 emission estimates. These profiles have been simplified somewhat in that emissions of those species which are least significant have been added to 'unspeciated'.

Table A4.1 Composite profile for SNAP 1.

species	Proportion
formaldehyde	55.4%
m-xylene	4.5%
butane	4.1%
ethane	2.7%
propane	2.7%
pentane	1.9%
propylene	1.7%
ethylene	1.6%
benzene	1.6%
hexane	1.4%
ethylbenzene	1.3%
toluene	1.1%
o-xylene	1.0%
2-methylbutane	0.8%
2,4-dimethylpentane	0.7%
2-methylpropane	0.5%
acetone	0.5%
1-heptene	0.4%
1-hexene	0.4%
1-decene	0.3%
acetylene	0.2%
unspeciated/other species	15.1%

Table A4.2 Composite profile for SNAP 2.

species	Proportion
pentane	13.8%
ethane	11.5%
butane	8.0%
2-methylbutane	7.4%
ethylene	7.3%
benzene	6.8%
propane	6.2%
cyclohexane	4.2%
formaldehyde	4.0%
propylene	3.7%
toluene	3.0%
heptane	3.0%
2-methylpropane	2.8%
ethanol	2.8%
hexane	2.7%
methylcyclohexane	2.4%
1-hexene	1.5%
butene	1.4%
2-pentene	1.1%
1-pentene	0.5%
2-methyl-2-butene	0.3%
3-methyl-1-butene	0.3%
2-methyl-1-butene	0.2%
naphthalene	0.2%
unspeciated/other species	5.1%

Table A4.3 Composite profile for SNAP 3.

species	Proportion
formaldehyde	17.7%
benzene	12.7%
pentane	10.1%
butane	9.3%
ethylene	8.8%
propane	4.2%
ethanol	4.1%
2-methylbutane	3.5%
ethane	3.1%
toluene	2.0%
propylene	1.2%
hexane	1.1%
cyclohexane	0.9%
acetone	0.8%
acetylene	0.6%
1-butene	0.6%
m-xylene	0.4%

2-methylpentane	0.3%
2,2-dimethylpropane	0.3%
2-methylpropane	0.2%
ethylbenzene	0.2%
3-methylpentane	0.2%
naphthalene	0.2%
C8 alkanes	0.1%
unspeciated/other species	17.3%

Table A4.4 Composite profile for SNAP 4.

species	Proportion
ethanol	24.4%
butane	5.3%
ethylene	4.3%
propane	4.2%
propylene	3.8%
hexane	3.0%
pentane	3.0%
methyl acetate	2.2%
ethane	2.1%
dichloromethane	1.7%
2-methylpropane	1.3%
2-methylbutane	1.2%
acetone	1.1%
toluene	1.1%
chloroethane	1.0%
trichloroethene	1.0%
1,2-dichloroethane	1.0%
benzene	0.8%
heptane	0.8%
chloromethane	0.8%
C7 cycloalkanes	0.6%
decane	0.6%
methanol	0.6%
dimethyl ether	0.5%
octane	0.5%
m-xylene	0.5%
unspeciated hydrocarbons	0.5%
1,1-dichloroethene	0.5%
2-propanol	0.4%
nonane	0.4%
2-methylpentane	0.4%
acrylic acid	0.3%
chloroethene	0.3%
C7 alkanes	0.3%
dimethylformamide	0.3%
carbonyl sulphide	0.3%

diisopropyl ether	0.3%
tetrahydrofuran	0.3%
trimethylfluorosilane	0.3%
ethyl acetate	0.3%
3-methylpentane	0.3%
acetic acid	0.3%
tetrachloroethene	0.2%
ethylbenzene	0.2%
ethyl acrylate	0.2%
ethylamine	0.2%
undecane	0.2%
butene	0.2%
p-xylene	0.2%
acrylonitrile	0.2%
o-xylene	0.2%
trifluoromethane	0.2%
1-butene	0.2%
1,3-butadiene	0.2%
C8 cycloalkanes	0.2%
trichloromethane	0.2%
2,3-dimethylbutane	0.2%
styrene	0.2%
methyl formate	0.2%
1,2,4-trimethylbenzene	0.2%
phenol	0.2%
cyclohexane	0.1%
C10 alkanes	0.1%
acetaldehyde	0.1%
cyclohexanone	0.1%
C9 alkanes	0.1%
C8 alkanes	0.1%
4-methyldecane	0.1%
methylcyclopentane	0.1%
unspeciated/other species	22.5%

Table A4.5 Composite profile for SNAP 5.

species	Proportion
butane	30.0%
propane	10.3%
pentane	10.2%
ethane	8.4%
2-methylpropane	7.3%
2-methylbutane	6.1%
heptane	5.2%
hexane	5.0%
octane	4.6%
C7 alkanes	1.2%

C8 alkanes	0.9%
2-methylpentane	0.8%
2-pentene	0.4%
3-methylpentane	0.4%
benzene	0.4%
trans-2-pentene	0.3%
trans-2-butene	0.3%
cis-2-butene	0.3%
1-pentene	0.2%
toluene	0.2%
methylpropene	0.2%
C6 alkenes	0.2%
1-butene	0.2%
cis-2-pentene	0.2%
C7 cycloalkanes	0.1%
2-methyl-2-butene	0.1%
unspeciated/other species	6.6%

Table A4.6 Composite profile for SNAP 6.

species	Proportion
ethanol	9.4%
methanol	6.4%
toluene	5.2%
acetone	5.0%
butane	4.4%
trichloroethene	4.0%
m-xylene	3.2%
2-butanone	3.0%
ethyl acetate	2.8%
4-methyl-2-pentanone	2.5%
1,1,1-trichloroethane	2.2%
dichloromethane	2.0%
decane	1.8%
1,2,4-trimethylbenzene	1.7%
hexane	1.6%
2-propanol	1.6%
tetrachloroethene	1.5%
butyl acetate	1.4%
ethylbenzene	1.2%
1-butanol	1.2%
methylethylbenzene	1.0%
nonane	1.0%
1-propanol	1.0%
undecane	0.9%
propane	0.9%
2-butanol	0.8%
o-xylene	0.8%

p-xylene	0.8%
2-propyl acetate	0.7%
dipentene	0.6%
ethyldimethylbenzene	0.6%
4-methyldecane	0.5%
1,3,5-trimethylbenzene	0.5%
1,2,3-trimethylbenzene	0.5%
2-methyl-1-propanol	0.5%
2-methylpentane	0.4%
3-methylnonane	0.4%
3-ethyl-2-methylheptane	0.4%
2-butoxyethanol	0.4%
4-methyl-4-hydroxy-2-pentanone	0.4%
2-(2-butoxyethoxy)ethanol	0.4%
heptane	0.4%
3-methylpentane	0.4%
1-methoxy-2-propanol	0.4%
cyclohexane	0.4%
2-(2-ethoxyethoxy)ethanol	0.4%
2-methylnonane	0.4%
propylcyclohexane	0.4%
unspeciated aromatic hydrocarbons	0.4%
2,6-dimethyloctane	0.4%
C10 cycloalkanes	0.3%
3-methylhexane	0.3%
2-methylhexane	0.3%
3-methyldecane	0.3%
C11 alkanes	0.3%
(1-methylpropyl)cyclohexane	0.3%
4-methylnonane	0.3%
1-methyl-4-isopropylcyclohexane	0.3%
propyl acetate	0.3%
propylbenzene	0.3%
1-ethoxy-2-propanol	0.3%
1-methyl-4-isopropylbenzene	0.3%
2-methyldecane	0.3%
butylcyclohexane	0.3%
methylcyclopentane	0.3%
styrene	0.3%
1,4-dichlorobenzene	0.3%
C10 alkanes	0.3%
benzyl alcohol	0.3%
ethylene glycol	0.3%
3-ethyltoluene	0.3%
methylpropylbenzene	0.3%
1-ethyl-3-methylcyclohexane	0.3%
1,2-propanediol	0.2%
1-(2-butoxy-1-methyl-ethoxy)-2-propanol	0.2%
2,2,4-trimethyl-1,3-pentanediol	0.2%

monoisobutyrate	
tri-n-butyl phosphate	0.2%
1,2,3,5-tetramethylbenzene	0.2%
1-methoxy-2-propyl acetate	0.2%
cyclohexanone	0.2%
2-ethoxyethanol	0.2%
2-methylpropane	0.2%
2-ethoxyethyl acetate	0.2%
tetradecane	0.2%
dimethylcyclopentane	0.2%
(1-methylethyl)cyclohexane	0.2%
(2-methylpropyl)cyclohexane	0.2%
1-methyl-3-propylbenzene	0.2%
2-butoxyethyl acetate	0.2%
methylcyclohexane	0.2%
1,2,4,5-tetramethylbenzene	0.2%
pine oil	0.1%
1,2,3-trimethylcyclohexane	0.1%
5-methyldecane	0.1%
2-[2-(2-ethoxy-ethoxy)-ethoxy]ethanol	0.1%
4-methyloctane	0.1%
2-methyloctane	0.1%
2-(methoxyethoxy)ethanol	0.1%
1-ethoxy-2-propyl acetate	0.1%
2,5-dimethyloctane	0.1%
2-methoxyethanol	0.1%
1-(2-methoxy-1-methyl-ethoxy)-2-propanol	0.1%
1-(2-ethoxy-1-methyl-ethoxy)-2-propanol	0.1%
2-isopropoxyethanol	0.1%
3,4-dimethylheptane	0.1%
3-methyloctane	0.1%
1,2,3,4-tetramethylbenzene	0.1%
2,2,3,3-tetramethylhexane	0.1%
1-ethyl-4-methylcyclohexane	0.1%
dodecane	0.1%
dimethyl ether	0.1%
4-ethyltoluene	0.1%
2-(2-butoxyethoxy)ethyl acetate	0.1%
2-(2-ethoxyethoxy)ethyl acetate	0.1%
unspeciated hydrocarbons	0.1%
(2-methyl-1-propyl)acetate	0.1%
2-methoxyethyl acetate	0.1%
3,3-dimethyloctane	0.1%
ethylcyclohexane	0.1%
2-methyl-5-ethyloctane	0.1%
3,7-dimethylnonane	0.1%
C12 alkanes	0.1%
decalin	0.1%
2,3-dimethylheptane	0.1%

3-ethylheptane	0.1%
1-methoxy-2-ethanol	0.1%
indan	0.1%
unspeciated/other species	6.4%

Table A4.7 Composite profile for SNAP 7.

species	Proportion
2-methylbutane	9.9%
toluene	8.0%
butane	7.5%
ethylene	6.1%
C13+ aromatic hydrocarbons	5.3%
pentane	5.1%
hexane	4.7%
benzene	4.4%
2-methylpropane	3.5%
C13+ alkanes	3.1%
propylene	3.0%
acetylene	3.0%
o-xylene	2.4%
2-methylpropene	2.4%
ethylbenzene	2.4%
m-xylene	2.4%
C9 aromatic hydrocarbons	2.4%
formaldehyde	2.2%
1,2,4-trimethylbenzene	2.1%
p-xylene	1.8%
ethane	1.4%
2-butene	1.4%
1,3-butadiene	1.1%
acetaldehyde	0.9%
2-pentene	0.9%
heptane	0.9%
1,3,5-trimethylbenzene	0.8%
unspeciated cycloalkanes	0.7%
2-methylhexane	0.7%
C10 aromatic hydrocarbons	0.7%
1-butene	0.6%
propane	0.6%
1-pentene	0.6%
3-methylhexane	0.5%
styrene	0.5%
1,2,3-trimethylbenzene	0.5%
benzaldehyde	0.4%
1,3-hexadiene	0.4%
octane	0.4%
acrolein	0.3%
propyne	0.3%

3-methylheptane	0.3%
decane	0.3%
acetone	0.3%
3-methyl benzaldehyde	0.2%
1-propanal	0.2%
crotonaldehyde	0.2%
2-methyl benzaldehyde	0.2%
C10 alkanes	0.2%
C11 alkanes	0.2%
C12 alkanes	0.2%
2-methylheptane	0.2%
unspeciated/other species	1.4%

Table A4.8 Composite profile for SNAP 8.

species	Proportion
unspeciated alkanes	33.2%
ethylene	6.8%
toluene	4.7%
unspeciated alkenes	4.1%
acetylene	3.0%
benzene	3.0%
unspeciated aromatic hydrocarbons	2.8%
formaldehyde	2.5%
propylene	2.5%
2-methylbutane	2.1%
butane	1.8%
m-xylene	1.6%
p-xylene	1.6%
o-xylene	1.3%
ethylbenzene	1.1%
pentane	1.1%
2-methylpentane	1.0%
2-methylpropane	0.9%
ethane	0.8%
1,3-butadiene	0.8%
1,2,4-trimethylbenzene	0.7%
acetone	0.6%
hexane	0.6%
3-methylpentane	0.6%
acetaldehyde	0.6%
hexamethylcyclotrisiloxane	0.5%
propane	0.5%
2-butene	0.4%
1-butene	0.4%
4-ethyltoluene	0.4%
3-ethyltoluene	0.4%
2-methylheptane	0.4%

3-methylheptane	0.4%
4-methylheptane	0.4%
1-pentene	0.4%
1-propanal	0.3%
1-butanal	0.3%
1,3,5-trimethylbenzene	0.3%
2-methylhexane	0.3%
2-ethyltoluene	0.3%
1,2,3-trimethylbenzene	0.3%
2-methylpropanal	0.2%
3-methylhexane	0.2%
propylbenzene	0.2%
2-pentene	0.2%
2,3-dimethylbutane	0.2%
dodecane	0.2%
methylpropene	0.2%
octamethylcyclotetrasiloxane	0.2%
isopropylbenzene	0.2%
2-methyl-2-butene	0.2%
undecane	0.2%
heptane	0.2%
3-methyl-1-butene	0.2%
2,2-dimethylbutane	0.2%
glyoxal	0.2%
octane	0.1%
unspeciated/other species	11.3%

Table A4.9 Composite profile for SNAP 9.

species	Proportion
propane	26.2%
ethane	26.2%
formaldehyde	17.5%
C7 alkanes	2.5%
ethanol	1.9%
C8 alkanes	1.6%
toluene	1.1%
C10 alkanes	1.0%
ethyl butanoate	0.8%
tetrachloroethene	0.8%
ethylbenzene	0.8%
terpenes	0.8%
hexane	0.7%
1,2-dichloroethene	0.7%
methylcyclohexane	0.7%
C9 alkanes	0.6%
limonene	0.6%
m-xylene	0.5%

2-butanol	0.5%
methanol	0.5%
C10 alkenes	0.5%
propyl propionate	0.5%
dichloromethane	0.4%
1,1,1-trichloroethane	0.4%
C11 alkanes	0.4%
trichloroethene	0.4%
p-xylene	0.4%
isopropylbenzene	0.4%
propylbenzene	0.4%
2-methylpentane	0.3%
C8 alkenes	0.3%
C6 alkenes	0.3%
ethyl propionate	0.3%
1,1-dichloroethane	0.3%
o-xylene	0.3%
benzene	0.3%
1,1-dimethylcyclopentane	0.3%
1,2-dimethylcyclopentane	0.3%
1,3-dimethylcyclopentane	0.3%
1-propanol	0.3%
diisopropyl ether	0.3%
dipropyl ether	0.3%
C7 alkenes	0.2%
cyclohexane	0.2%
propyl butanoate	0.2%
unspeciated/other species	5.6%

Appendix 5
POCP Values

POCP values for chemical species that are currently contained in the NAEI species database are given in the table below. In this table the methods given are as follows:

1. POCPs determined by the standard methodology using a photochemical trajectory model containing fully developed chemical schemes and NAEI speciated VOC emissions. The values are published in the open literature (Derwent *et al*, 1998; Jenkin & Hayman, 1999).

2. POCPs estimated by a documented methodology. This allows assignment of POCPs on the basis of consideration of how the values determined using the standard methodology vary with structure and reactivity, i.e. this method is optimised on the basis of the determined values, and then used to calculate POCPs for additional VOCs within the same classes (i.e., hydrocarbons, oxygenates and halocarbons). The methodology is described more fully elsewhere (Jenkin, 1998; Jenkin *et al*, 1997)

3. POCPs which have been assigned on the basis of an educated guess.

Species	POCP	Method	Reference
(1-methylethyl)cyclohexane	40.5	2	
(1-methylpropyl)cyclohexane	38.5	2	
(2-methyl-1-propyl)acetate	32.8	2	
(2-methylbutyl)cyclohexane	39.8	2	
(2-methylpropyl)cyclohexane	42.7	2	
1,1,1-trichloroethane	0.9	1	Derwent et al., 1998
1,1,1-trichlorotrifluoroethane	0.0	1	By definition
1,1,2,2-tetrachloroethane	7.7	2	
1,1,2-trichloroethane	6.2	2	
1,1,2-trimethylcyclohexane	41.2	2	
1,1,2-trimethylcyclopentane	40.8	2	
1,1,3-trimethylcyclohexane	41.2	2	
1,1,4,4-tetramethylcyclohexane	34.3	2	
1,1-dichloroethane	9.4	2	
1,1-dichloroethene	52.6	2	
1,1-dichlorotetrafluoroethane	0.0	1	By definition
1,1-dimethylcyclohexane	42.8	2	
1,1-dimethylcyclopentane	28.8	2	

Species	POCP	Method	Reference
1,2,3,4-tetrahydronaphthalene	115.1	2	
1,2,3,4-tetramethylbenzene	114.6	2	
1,2,3,5-tetramethylbenzene	136.0	2	
1,2,3,5-tetramethylcyclohexane	42.7	2	
1,2,3-trichlorobenzene	2.2	2	
1,2,3-trimethylbenzene	126.7	1	Derwent et al., 1998
1,2,3-trimethylcyclohexane	45.4	2	
1,2,3-trimethylcyclopentane	43.6	2	
1,2,4,4-tetramethylcyclopentane	37.5	2	
1,2,4,5-tetramethylbenzene	114.6	2	
1,2,4-trichlorobenzene	15.3	2	
1,2,4-trimethlycyclopentane	43.6	2	
1,2,4-trimethylbenzene	127.8	1	Derwent et al., 1998
1,2,4-trimethylcyclohexane	45.4	2	
1,2,4-trimethylcyclopentane	42.8	2	
1,2-diaminoethane	51.3	3	
1,2-dibromoethane	3.3	2	
1,2-dichlorobenzene	12.0	2	
1,2-dichloroethane	7.0	2	
1,2-dichloroethene	42.0	1	Derwent et al., 1998
1,2-dichlorotetrafluoroethane	0.0	1	By definition
1,2-dimethyl-3-isopropylcyclopentane	39.3	2	
1,2-dimethylcyclohexane	48.2	2	
1,2-dimethylcyclopentane	45.9	2	
1,2-ethanedioldiacetate	16.0	2	
1,2-ethylmethylcyclopentane	44.2	2	
1,2-propanediol	44.6	1	Jenkin and Hayman, 1999
1,3,4,5,6-pentahydroxy-2-hexanone	0.0	3	
1,3,5-trichlorobenzene	17.3	2	
1,3,5-trimethylbenzene	138.1	1	Derwent et al., 1998
1,3,5-trimethylcyclohexane	45.4	2	
1,3-butadiene	85.1	1	Derwent et al., 1998
1,3-dichlorobenzene	14.7	2	
1,3-diethylbenzene	104.1	2	
1,3-dimethyl-4-ethylbenzene	114.6	2	
1,3-dimethyl-5-propylbenzene	132.5	2	
1,3-dimethylcyclohexane	48.2	2	
1,3-dimethylcyclopentane	45.9	2	
1,3-dioxolane	50.9	2	
1,3-ethylmethylcyclopentane	44.2	2	
1,3-hexadiene	103.7	2	
1,4-butyrolacetone	35.6	2	
1,4-dichlorobenzene	5.0	2	
1,4-diethylbenzene	89.6	2	
1,4-dimethyl-2-isopropylbenzene	111.7	2	
1,4-dimethylcyclohexane	48.2	2	
1,4-dimethylpiperazine	51.3	3	
1,4-dioxane	38.4	2	

Species	POCP	Method	Reference
1-(2-butoxy-1-methyl-ethoxy)-2-propanol	41.3	2	
1-(2-ethoxy-1-methyl-ethoxy)-2-propanol	56.4	2	
1-(2-methoxy-1-methyl-ethoxy)-2-propanol	53.5	2	
1-(butoxyethoxy)-2-propanol	55.5	2	
1-butanal	79.5	1	Derwent et al., 1998
1-butanol	62.0	1	Jenkin and Hayman, 1999
1-butene	107.9	1	Derwent et al., 1998
1-butoxy-2-propanol	46.3	1	Jenkin and Hayman, 1999
1-butyne	73.2	2	
1-chloro-2,3-epoxypropane	10.2	2	
1-chloro-4-nitrobenzene	0.0	3	
1-chloropropane	15.3	2	
1-decene	91.7	2	
1-ethoxy-2-propanol	49.7	2	
1-ethoxy-2-propyl acetate	35.2	2	
1-ethyl-1,4-dimethylcyclohexane	38.7	2	
1-ethyl-2,2,6-trimethylcyclohexane	37.2	2	
1-ethyl-2,3-dimethylbenzene	114.6	2	
1-ethyl-2,3-dimethylcyclohexane	42.3	2	
1-ethyl-2-methylcyclopentane	36.5	2	
1-ethyl-2-propylbenzene	86.2	2	
1-ethyl-2-propylcyclohexane	40.0	2	
1-ethyl-3,5-dimethylbenzene	136.0	2	
1-ethyl-3-methylcyclohexane	45.6	2	
1-ethyl-3-methylcyclopentane	36.5	2	
1-ethyl-4-methylcyclohexane	45.6	2	
1-ethylpropylbenzene	105.7	3	
1-heptene	83.1	2	
1-hexanal	100.0	2	
1-hexene	87.4	1	Derwent et al., 1998
1-hydrophenol	78.2	2	
1-methoxy-2-butanol	47.6	2	
1-methoxy-2-ethanol	30.7	1	Jenkin and Hayman, 1999
1-methoxy-2-propanol	35.5	1	Jenkin and Hayman, 1999
1-methoxy-2-propyl acetate	32.3	2	
1-methyl-1-phenylcyclopropane	63.7	3	
1-methyl-1-propylbenzene	73.5	3	
1-methyl-1-propylcyclohexane	38.5	2	
1-methyl-1-propylcyclopentane	37.9	2	
1-methyl-2-isopropylbenzene	88.4	2	
1-methyl-2-propylbenzene	88.4	2	
1-methyl-3-(isopropyl)benzene	104.1	2	
1-methyl-3-isopropylcyclopentane	39.1	2	
1-methyl-3-propylbenzene	104.1	2	
1-methyl-4-isopropylbenzene	89.6	2	
1-methyl-4-isopropylcyclohexane	43.0	2	
1-methyl-4-tertbutylbenzene	87.3	2	
1-methylbutylbenzene	105.7	3	

Species	POCP	Method	Reference
1-methylcyclohexene	100.4	2	
1-methylindan	80.0	2	
1-methylindene	136.2	3	
1-nonene	95.6	2	
1-octene	78.2	2	
1-pentanal	76.5	1	Derwent et al., 1998
1-pentanol	59.5	2	
1-pentene	97.7	1	Derwent et al., 1998
1-propanal	79.8	1	Derwent et al., 1998
1-propanol	56.1	1	Jenkin and Hayman, 1999
11-methyl-1-dodecanol	31.0	2	
2,2'-iminodi(ethylamine)	51.3	3	
2,2'-iminodiethanol	51.3	3	
2,2,3,3-tetramethylbutane	12.9	2	
2,2,3,3-tetramethylhexane	19.2	2	
2,2,3-trimethylbutane	38.6	2	
2,2,3-trimethylpentane	39.1	2	
2,2,4,6,6-pentamethylheptane	21.4	2	
2,2,4-trimethyl-1,3-pentanediol monoisobutyrate	27.5	3	
2,2,4-trimethylpentane	24.7	2	
2,2,5-trimethylhexane	37.6	2	
2,2-dimethylbutane	24.1	1	Derwent et al., 1998
2,2-dimethylhexane	38.6	2	
2,2-dimethylpentane	38.6	2	
2,2-dimethylpropane	17.3	1	Derwent et al., 1998
2,3,3,4-tetramethylpentane	37.2	2	
2,3,3-trimethyl-1-butene	81.3	2	
2,3,3-trimethylpentane	38.0	2	
2,3,4-trimethylhexane	42.9	2	
2,3,4-trimethylpentane	25.7	2	
2,3,5-trimethylhexane	42.6	2	
2,3-dimethylbutane	54.1	1	Derwent et al., 1998
2,3-dimethylfuran	62.8	2	
2,3-dimethylheptane	42.6	2	
2,3-dimethylhexane	46.5	2	
2,3-dimethylnonane	37.7	2	
2,3-dimethyloctane	40.2	2	
2,3-dimethylpentane	39.1	2	
2,3-dimethylundecane	31.7	2	
2,4,4-trimethyl-1-pentene	81.1	2	
2,4,6-trichloro-1,3,5-triazine	51.3	3	
2,4-difluoroaniline	0.0	3	
2,4-dimethyl-1-(1-methylethyl)benzene	111.7	2	
2,4-dimethyl-1-isopropylbenzene	111.7	2	
2,4-dimethylfuran	62.8	2	
2,4-dimethylheptane	42.6	2	
2,4-dimethylhexane	46.5	2	

Species	POCP	Method	Reference
2,4-dimethylpentane	46.6	2	
2,4-toluene diisocyanate	51.3	3	
2,5-dimethyldecane	34.6	2	
2,5-dimethylfuran	62.8	2	
2,5-dimethylheptane	51.2	2	
2,5-dimethylhexane	44.6	2	
2,5-dimethyloctane	40.2	2	
2,6-dimethyldecane	35.1	2	
2,6-dimethylheptane	42.3	2	
2,6-dimethyloctane	40.2	2	
2,6-dimethylundecane	31.7	2	
2,6-toluene diisocyanate	51.3	3	
2,7-dimethyloctane	39.9	2	
2-(2-aminoethylamino)ethanol	51.3	3	
2-(2-butoxyethoxy)ethanol	50.2	2	
2-(2-butoxyethoxy)ethyl acetate	40.0	2	
2-(2-ethoxyethoxy)ethanol	49.3	2	
2-(2-ethoxyethoxy)ethyl acetate	34.6	2	
2-(2-hydroxy-ethoxy)ethanol	40.1	2	
2-(2-hydroxy-propoxy)-1-propanol	55.4	2	
2-(methoxyethoxy)ethanol	42.8	2	
2-[2-(2-ethoxy-ethoxy)-ethoxy]ethanol	35.7	2	
2-acetoxy-propyl acetate	14.3	2	
2-aminoethanol	51.3	3	
2-butanol	44.7	1	Jenkin and Hayman, 1999
2-butanone	37.3	1	Derwent et al., 1998
2-butanone oxime	51.3	3	
2-butene	113.9	1	Derwent et al., 1998
2-butoxyethanol	48.3	1	Jenkin and Hayman, 1999
2-butoxyethyl acetate	35.1	2	
2-chloroethanol	30.3	2	
2-chloropropane	14.5	2	
2-chlorotoluene	13.1	2	
2-ethoxyethanol	38.6	1	Jenkin and Hayman, 1999
2-ethoxyethyl acetate	34.6	2	
2-ethoxypropanol	65.7	2	
2-ethyl hexanol	63.2	2	
2-ethyl-1,3-dimethylbenzene	114.6	2	
2-ethyltoluene	89.8	1	Derwent et al., 1998
2-hexoxyethanol	44.7	2	
2-hydrophenol	78.2	2	
2-isopropoxyethanol	51.4	2	
2-methoxy-2-methylpropane	17.5	1	Jenkin and Hayman, 1999
2-methoxyethanol	30.7	1	Jenkin and Hayman, 1999
2-methoxyethyl acetate	40.5	2	
2-methoxypropane	39.4	2	
2-methyl benzaldehyde	-9.2	3	
2-methyl-1,3-dioxolane	46.2	2	

Species	POCP	Method	Reference
2-methyl-1-butene	77.1	1	Derwent et al., 1998
2-methyl-1-butylbenzene	86.2	2	
2-methyl-1-pentene	107.2	2	
2-methyl-1-propanol	36.0	1	Jenkin and Hayman, 1999
2-methyl-2,4-pentanediol	46.4	2	
2-methyl-2-butene	84.2	1	Derwent et al., 1998
2-methyl-2-hexene	81.3	2	
2-methyl-2-pentene	79.9	2	
2-methyl-2-propanol	10.6	1	Jenkin and Hayman, 1999
2-methyl-5-ethyloctane	38.0	2	
2-methylbutanal	86.0	2	
2-methylbutane	40.5	1	Derwent et al., 1998
2-methyldecalin	41.4	2	
2-methyldecane	37.5	2	
2-methylfuran	59.6	2	
2-methylheptane	44.6	2	
2-methylhexane	41.1	1	Derwent et al., 1998
2-methylnonane	39.9	2	
2-methyloctane	42.8	2	
2-methylpentane	42.0	1	Derwent et al., 1998
2-methylpropanal	51.4	1	Derwent et al., 1998
2-methylpropane	30.7	1	Derwent et al., 1998
2-methylpropenal	82.9	2	
2-methylpropene	62.7	1	Derwent et al., 1998
2-methylpropyl acetate	21.3	2	
2-methylpyridine	51.3	3	
2-methylundecane	35.2	2	
2-pentanone	54.8	1	Derwent et al., 1998
2-pentene	111.9	1	Derwent et al., 1998
2-phenoxy ethanol	43.9	2	
2-phenylpropene	14.2	3	
2-propanol	18.8	1	Jenkin and Hayman, 1999
2-propen-1-ol	74.6	2	
2-propyl acetate	21.1	1	Jenkin and Hayman, 1999
3,3,4-trimethylhexane	37.6	2	
3,3,5-trimethylheptane	36.2	2	
3,3-dimethylheptane	37.2	2	
3,3-dimethylhexane	38.0	2	
3,3-dimethyloctane	35.8	2	
3,3-dimethylpentane	37.8	2	
3,4-dimethylheptane	42.6	2	
3,4-dimethylhexane	45.3	2	
3,5,5-trimethylhexane	32.1	2	
3,5-dimethyloctane	40.5	2	
3,6-dimethyloctane	40.5	2	
3,7-dimethylnonane	37.9	2	
3-(2-hydroxy-propoxy)-1-propanol	56.4	2	
3-chloro-4-fluoropicoline	51.3	3	

Species	POCP	Method	Reference
3-chloropropene	46.0	2	
3-chloropyridine	51.3	3	
3-ethyl-2-methylheptane	39.9	2	
3-ethyl-2-methylhexane	43.1	2	
3-ethyl-2-methylpentane	46.1	2	
3-ethylheptane	43.1	2	
3-ethylhexane	41.5	2	
3-ethyloctane	44.4	2	
3-ethylpentane	47.7	2	
3-ethyltoluene	101.9	1	Derwent et al., 1998
3-heptene	103.3	2	
3-hydrophenol	78.2	2	
3-methyl benzaldehyde	-9.2	3	
3-methyl-1-butene	67.1	1	Derwent et al., 1998
3-methyl-T-2-pentene	107.2	2	
3-methylbutanal	78.6	2	
3-methylbutanol	43.3	1	Jenkin and Hayman, 1999
3-methyldecane	37.7	2	
3-methylfuran	59.6	2	
3-methylheptane	45.0	2	
3-methylhexane	36.4	1	Derwent et al., 1998
3-methylnonane	40.2	2	
3-methyloctane	42.6	2	
3-methylpentane	47.9	1	Derwent et al., 1998
3-methylundecane	35.1	2	
3-pentanone	41.4	1	Derwent et al., 1998
3A,4,7,7A-tetrahydro-4,7-methanoindene	72.0	3	
4,4'-methylenedianiline	51.3	3	
4,4-dimethylheptane	37.2	2	
4,5-dimethylnonane	37.9	2	
4,6-dimethylindan	132.5	3	
4,7-dimethylindan	132.5	3	
4-4'-methylenediphenyl diisocyanate	51.3	3	
4-bromophenyl acetate	51.3	3	
4-chlorotoluene	13.1	2	
4-ethyl morpholine	51.3	3	
4-ethyl-1,2-dimethylbenzene	114.6	2	
4-ethyloctane	44.4	2	
4-ethyltoluene	90.6	1	Derwent et al., 1998
4-isopropyltoluene	89.6	2	
4-methyl benzaldehyde	-9.2	3	
4-methyl-1,3-dioxol-2-one	21.9	2	
4-methyl-1-pentene	66.0	2	
4-methyl-2-pentanol	60.9	2	
4-methyl-2-pentanone	49.0	1	Derwent et al., 1998
4-methyl-4-hydroxy-2-pentanone	30.7	1	Jenkin and Hayman, 1999
4-methyl-T-2-pentene	79.9	2	
4-methyldecane	37.7	2	

Species	POCP	Method	Reference
4-methylheptane	45.0	2	
4-methylnonane	40.2	2	
4-methyloctane	42.3	2	
4-methylpentene	66.0	2	
4-propylheptane	40.5	2	
5-methyl-2-hexanone	51.6	2	
5-methyldecane	37.7	2	
5-methylnonane	40.1	2	
5-methylundecane	35.1	2	
6-ethyl-2-methyldecane	32.8	2	
6-ethyl-2-methyloctane	38.0	2	
6-methyldecane	37.6	2	
6-methylundecane	35.1	2	
8-methyl-1-nonanol	50.2	2	
acenaphthene	121.9	2	
acenaphthylene	145.6	2	
acetaldehyde	64.1	1	Derwent et al., 1998
acetic acid	9.7	1	Derwent et al., 1998
acetic anhydride	2.5	2	
acetone	9.4	1	Derwent et al., 1998
acetonitrile	0.0	3	
acetyl chloride	0.2	2	
acetylene	8.5	1	Derwent et al., 1998
acrolein	73.0	2	
acrylamide	51.3	3	
acrylic acid	34.4	2	
acrylonitrile	0.0	3	
adiponitrile	51.3	3	
aniline	51.3	3	
anthanthrene	0.0	3	
anthracene	138.9	2	
atrazine	0.0	3	
benzaldehyde	-9.2	1	Derwent et al., 1998
benzene	21.8	1	Derwent et al., 1998
benzene-1,2,4-tricarboxylic acid 1,2-anhydride	51.3	3	
benzo (a) anthracene	0.0	3	
benzo (a) pyrene	0.0	3	
benzo (b) fluoranthene	0.0	3	
benzo (c) phenanthrene	0.0	3	
benzo (e) pyrene	0.0	3	
benzo (g,h,i) fluoranthene	0.0	3	
benzo (g,h,i) perylene	0.0	3	
benzo (k) fluoranthene	0.0	3	
benzophenone	51.3	3	
benzopyrenes	0.0	3	
benzyl alcohol	46.9	2	
benzyl chloride	17.7	2	

Species	POCP	Method	Reference
biphenyl	66.6	2	
bis(2-hydroxyethyl)ether	40.2	2	
bis(chloromethyl)ether	29.2	2	
bis(tributyltin) oxide	0.0	3	
bromoethane	1.3	2	
bromoethene	12.2	2	
bromomethane	0.6	2	
butane	35.2	1	Derwent et al., 1998
butanethiols	0.0	3	
butene	99.6	3	
butoxyl	51.3	3	
butyl acetate	26.9	1	Jenkin and Hayman, 1999
butyl acrylate	47.9	2	
butyl glycolate	26.8	2	
butyl lactate	29.1	2	
butylbenzene	69.0	2	
butylcyclohexane	42.5	2	
butyrolactone	51.3	3	
C10 alkanes	38.7	3	
C10 alkenes	87.8	3	
C10 aromatic hydrocarbons	132.0	3	
C10 cycloalkanes	38.4	3	
C11 alkanes	36.4	3	
C11 alkenes	84.5	3	
C11 aromatic hydrocarbons	134.2	3	
C11 cycloalkanes	38.4	3	
C12 alkanes	35.7	3	
C12 cycloalkanes	35.7	3	
C13 alkanes	31.7	3	
C13+ alkanes	31.7	3	
C13+ aromatic hydrocarbons	128.3	3	
C14 alkanes	30.7	3	
C15 alkanes	28.4	3	
C16 alkanes	24.2	3	
C2-alkyl-anthracenes	139.8	2	
C2-alkyl-benzanthracenes	0.0	3	
C2-alkyl-benzophenanthrenes	0.0	3	
C2-alkyl-chrysenes	0.0	3	
C2-alkyl-phenanthrenes	115.7	3	
C5 alkenes	87.6	3	
C6 alkenes	95.7	3	
C7 alkanes	42.3	3	
C7 alkenes	95.9	3	
C7 cycloalkanes	51.0	3	
C8 alkanes	42.2	3	
C8 alkenes	93.7	3	
C8 cycloalkanes	48.1	3	
C9 alkanes	40.4	3	

Species	POCP	Method	Reference
C9 alkenes	90.8	3	
C9 aromatic hydrocarbons	98.6	3	
C9 cycloalkanes	41.4	3	
camphor/fenchone	74.5	3	
carbon disulphide	0.0	3	
carbon tetrachloride	0.0	1	By definition
carbonyl sulphide	0.0	3	
chlorobenzene	9.9	2	
chlorobutane	17.6	2	
chlorocyclohexane	34.8	2	
chlorodifluoromethane	0.2	2	
chloroethane	10.4	2	
chloroethylene	36.1	2	
chlorofluoromethane	1.9	2	
chlorofluoropicolines	51.3	3	
chloromethane	0.5	1	Derwent et al., 1998
chloroprene	43.7	2	
chrysene	0.0	3	
cis-1,3-dimethylcyclopentane	45.8	2	
cis-2-butene	114.6	1	Derwent et al., 1998
cis-2-hexene	106.9	1	Derwent et al., 1998
cis-2-octene	99.4	2	
cis-2-pentene	112.1	1	Derwent et al., 1998
coronene	0.0	3	
crotonaldehyde	70.0	2	
cycloheptane	53.4	2	
cyclohexanamine	51.3	3	
cyclohexane	29.0	1	Derwent et al., 1998
cyclohexanol	51.8	1	Jenkin and Hayman, 1999
cyclohexanone	29.9	1	Derwent et al., 1998
cyclooctane	46.7	2	
cyclopenta (c,d) pyrene	0.0	3	
cyclopenta-anthracenes	0.0	3	
cyclopenta-phenanthrenes	0.0	3	
cyclopentane	51.5	2	
cyclopentene	106.8	2	
decalin	44.4	2	
decane	38.4	1	Derwent et al., 1998
diacetoneketogulonic acid	0.0	3	
diaminotoluene	51.3	3	
diazinon	51.3	3	
dibenzanthracenes	0.0	3	
dibenzo (a,h) anthracene	0.0	3	
dibenzophenanthrenes	0.0	3	
dibenzopyrenes	0.0	3	
dichlorobutenes	34.7	3	
dichlorodifluoromethane	0.0	1	By definition
dichlorofluoromethane	1.3	2	

Species	POCP	Method	Reference
dichloromethane	6.8	1	Derwent et al., 1998
dichlorvos	51.3	3	
diethyl disulphide	0.0	3	
diethyl ether	44.5	1	Jenkin and Hayman, 1999
diethyl sulphate	0.0	3	
diethylamine	51.3	3	
diethylbenzene	105.7	3	
difluoromethane	0.6	2	
dihydroxyacetone	28.5	2	
diisopropyl ether	39.8	1	Jenkin and Hayman, 1999
diisopropylbenzene	82.2	2	
dimethoxymethane	16.4	1	Jenkin and Hayman, 1999
dimethyl disulphide	0.0	3	
dimethyl esters	17.1	3	
dimethyl ether	18.9	1	Jenkin and Hayman, 1999
dimethyl furans	64.6	3	
dimethyl sulphate	0.0	3	
dimethyl sulphide	0.0	3	
dimethylamine	51.3	3	
dimethylbutene	59.9	3	
dimethylcyclohexane	47.3	2	
dimethylcyclopentane	45.8	3	
dimethylformamide	51.3	3	
dimethylhexene	93.7	3	
dimethylnonane	38.4	3	
dimethylpentane	49.4	3	
dipentene	74.5	2	
dipropyl ether	53.1	2	
dodecane	35.7	1	Derwent et al., 1998
ethane	12.3	1	Derwent et al., 1998
ethanethiol	0.0	3	
ethanol	39.9	1	Jenkin and Hayman, 1999
ethofumesate	51.3	3	
ethyl acetate	20.9	1	Jenkin and Hayman, 1999
ethyl acrylate	41.4	2	
ethyl butanoate	30.1	2	
ethyl chloroformate	10.1	2	
ethyl hexanol	53.5	3	
ethyl lactate	32.8	2	
ethyl pentanoate	32.4	2	
ethyl propionate	19.9	2	
ethylamine	51.3	3	
ethylbenzene	73.0	1	Derwent et al., 1998
ethylcyclohexane	48.3	2	
ethylcyclopentane	46.6	2	
ethyldimethylbenzene	132.0	3	
ethylene	100.0	1	Derwent et al., 1998
ethylene glycol	37.3	1	Jenkin and Hayman, 1999

Species	POCP	Method	Reference
ethylene oxide	2.4	2	
ethylisopropylbenzene	105.7	3	
fenitrothion	51.3	3	
fluoranthene	0.0	3	
fluorene	77.4	2	
formaldehyde	51.9	1	Derwent et al., 1998
formanilide	0.0	3	
formic acid	3.2	1	Derwent et al., 1998
fumaric acid	17.1	2	
glycerol	39.2	2	
glyoxal	58.0	2	
heptadecane	12.2	2	
heptane	49.4	1	Derwent et al., 1998
hexachlorocyclohexane	2.3	2	
hexachloroethane	0.0	1	By definition
hexadecane	26.0	2	
hexafluoropropene	69.4	2	
hexamethylcyclotrisiloxane	0.0	3	
hexamethyldisilane	0.0	3	
hexamethyldisiloxane	0.0	3	
hexamethylenediamine	51.3	3	
hexane	48.2	1	Derwent et al., 1998
hexylcyclohexane	36.7	2	
indan	79.7	2	
indene	137.7	2	
indeno (1,2,3-c,d) pyrene	0.0	3	
iodomethane	0.7	2	
isobutylbenzene	57.8	2	
isobutylcyclohexane	36.3	2	
isopentylbenzene	67.3	2	
isophorone	77.6	2	
isoprene	109.2	1	Derwent et al., 1998
isoprene + BVOC	90.0	3	
isopropanolamine	51.3	3	
isopropylbenzene	50.0	1	Derwent et al., 1998
isopropylcyclohexane	38.0	2	
isopropylcyclopentane	43.7	2	
limonene	74.5	2	
m-cresol	68.0	2	
m-xylene	110.8	1	Derwent et al., 1998
malathion	51.3	3	
maleic anhydride	26.8	2	
menthene	89.9	3	
methacrylic acid	50.2	2	
methanethiol	0.0	3	
methanol	14.0	1	Jenkin and Hayman, 1999
methoxy-2-propoxy-2-propanol	37.5	2	
methyl acetate	5.9	1	Jenkin and Hayman, 1999

Species	POCP	Method	Reference
methyl acrylate	39.1	2	
methyl butanoate	29.6	2	
methyl ethyl ether	25.3	2	
methyl formate	2.7	1	Jenkin and Hayman, 1999
methyl furans	40.2	3	
methyl glyoxal	72.0	2	
methyl methacrylate	46.7	2	
methyl naphthalenes	125.2	3	
methyl pentanoate	31.9	2	
methyl styrene	14.2	3	
methyl-anthracenes	0.0	3	
methyl-benzanthracenes	0.0	3	
methyl-benzphenanthrenes	0.0	3	
methyl-chrysenes	0.0	3	
methyl-fluoranthenes	0.0	3	
methyl-phenanthrenes	117.4	2	
methylamine	0.0	3	
methylcyclodecane	39.3	2	
methylcycloheptane	47.0	2	
methylcyclohexane	51.0	2	
methylcyclopentane	48.1	2	
methylethylbenzene	94.1	3	
methylhexane	38.8	3	
methylindane	80.0	2	
methylpropene	62.7	1	Derwent et al., 1998
methylpropylbenzene	105.7	3	
methyltetralin	114.0	3	
monohydric phenols	78.2	2	
N,N-diethyl benzenamine	51.3	3	
N,N-dimethyl benzenamine	51.3	3	
N-(hydroxymethyl) acrylamide	51.3	3	
N-methyl pyrrolidone	51.3	3	
naphthalene	97.7	2	
naphthol	61.1	2	
Nedocromil Sodium	0.0	3	
nitrobenzene	0.0	3	
nitromethane	0.0	3	
nitropentane	18.5	2	
nitropropane	0.0	3	
nonane	41.4	1	Derwent et al., 1998
o-cresol	67.3	2	
o-xylene	105.3	1	Derwent et al., 1998
octahydroindan	44.5	2	
octamethylcyclotetrasiloxane	0.0	3	
octane	45.3	1	Derwent et al., 1998
octylamine	51.3	3	
p-benzoquinone	51.6	2	
p-cresol	65.5	2	

Species	POCP	Method	Reference
p-xylene	101.0	1	Derwent et al., 1998
palmitic acid	27.2	2	
pentadecane	28.4	2	
pentafluoroethane	0.1	2	
pentane	39.5	1	Derwent et al., 1998
pentanethiols	0.0	3	
pentylbenzene	67.3	2	
pentylcyclohexane	39.6	2	
permethrin	51.3	3	
perylene	0.0	3	
phenanthrene	97.8	2	
phenol	63.3	2	
phenoxyacetic acid (phenoxy acid)	15.2	3	
phenylacetic acid	15.2	3	
phenylacetonitrile	51.3	3	
phenylnaphthalenes	114.8	2	
phorate	0.0	3	
phthalic anhydride	105.3	3	
pine oil	74.5	3	
polyethylene glycol	0.0	3	
polyisobutene	0.0	3	
polyvinyl chloride	0.0	3	
potassium phenylacetate	51.3	3	
propadiene	84.7	2	
propane	17.6	1	Derwent et al., 1998
propanetriol	33.5	2	
propanoic acid	15.0	1	Derwent et al., 1998
propionitrile	0.0	3	
propyl acetate	28.2	1	Jenkin and Hayman, 1999
propyl butanoate	31.9	2	
propyl propionate	28.5	2	
propylamine	51.3	3	
propylbenzene	63.6	1	Derwent et al., 1998
propylcyclohexane	45.4	2	
propylcyclopentane	44.5	2	
propylene	112.3	1	Derwent et al., 1998
propylene oxide	13.4	2	
propyne	74.6	2	
pyrene	0.0	3	
pyridine	51.3	3	
salicylic acid	44.8	2	
sec-butylbenzene	68.9	2	
sec-butylcyclohexane	42.6	2	
simazine	0.0	3	
sodium 2-ethylhexanoate	51.3	3	
sodium acetate	0.0	3	
sodium phenylacetate	51.3	3	
styrene	14.2	1	Derwent et al., 1998

Species	POCP	Method	Reference
styrene acrylate	0.0	3	
sulphanilamide	0.0	3	
terpenes	74.5	2	
tert-butylamine	51.3	3	
tert-butylbenzene	53.4	2	
tert-butylcyclohexane	39.5	2	
tert-butylcyclopropane	11.5	2	
tert-pentylbenzene	67.3	2	
tetrachloroethene	2.9	1	Derwent et al., 1998
tetradecane	30.7	2	
tetrafluoroethene	9.4	2	
tetrahydrofuran	57.0	2	
tetrahydrofuryl alcohol	58.3	2	
tetramethylcyclohexane	38.5	3	
toluene	63.7	1	Derwent et al., 1998
toluene-2,3-diamine	51.3	3	
toluene-2,4-diamine	51.3	3	
toluene-2,4-diisocyanate	51.3	3	
toluene-2,5-diamine	51.3	3	
toluene-2,6-diamine	51.3	3	
toluene-2,6-diisocyanate	51.3	3	
toluene-3,4-diamine	51.3	3	
toluene-3,5-diamine	51.3	3	
trans-2-butene	113.2	1	Derwent et al., 1998
trans-2-hexene	107.3	1	Derwent et al., 1998
trans-2-pentene	111.7	1	Derwent et al., 1998
trans-3-hexene	107.2	2	
tri-n-butyl phosphate	0.0	3	
trialkyl phosphate	0.0	3	
trichloroethene	32.5	1	Derwent et al., 1998
trichlorofluoromethane	0.0	1	By definition
trichloromethane	2.3	1	Derwent et al., 1998
tridecane	32.7	2	
triethanolamine	51.3	3	
triethylamine	51.3	3	
trifluoroethene	54.7	2	
trifluoromethane	0.0	3	
trifluralin	51.3	3	
trimethylamine	51.3	3	
trimethylfluorosilane	0.0	3	
undecane	38.4	1	Derwent et al., 1998
unspeciated	51.3	3	
unspeciated alcohols	36.4	3	
unspeciated aliphatic hydrocarbons	36.8	3	
unspeciated alkanes	36.8	3	
unspeciated alkenes	97.5	3	
unspeciated amines	51.3	3	
unspeciated aromatic hydrocarbons	95.4	3	

Species	POCP	Method	Reference
unspeciated carboxylic acids	15.2	3	
unspeciated cycloalkanes	43.4	3	
unspeciated hydrocarbons	71.9	3	
unspeciated ketones	42.0	3	
urea	0.0	3	
vinyl acetate	48.5	2	