EPA-600-R-92-025
February 1992

INDOOR AIR QUALITY DATA BASE FOR ORGANIC COMPOUNDS

by

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Prepared for:

U. S. Environmental Protection Agency
Office of Research and Development
Washington, DC 20460

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completi

1. REPORT NO. EPA-600-R-92-025	2.	3. PB92-158468
4. TITLE AND SUBTITLE Indoor Air Quality Data Base for Organic Compounds		5. REPORT DATE February 1992
		6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) Max M. Samfield		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS See Block 12		10. PROGRAM ELEMENT NO.
		11. CONTRACT/GRANT NO. NA (Inhouse)
12. SPONSORING AGENCY NAME AND ADDRESS EPA, Office of Research and Development, Air and Energy Engineering Research Laboratory, Research Triangle Park, North Carolina 27711		13. TYPE OF REPORT AND PERIOD COVERED Final report; 1-11/91
		14. SPONSORING AGENCY CODE EPA/600/13

15. SUPPLEMENTARY NOTES AEERL project officer is Bruce A. Tichenor, Mail Drop 54, 919/541-2991.

16. ABSTRACT The report gives results of the compilation of a data base for concentrations of organic compounds measured indoors. Based on a review of the literature from 1979 through 1990, the data base contains information on over 220 compounds ranging in molecular weight from 30 to 446. The compounds are arranged in order of increasing number of carbon atoms, from 1 to 31. The data base contains the number of carbon atoms; the name of the compound; its empirical formula; its molecular weight; the odor threshold (when available); the minimum, maximum, median, and mean concentrations; the standard deviation; the reference number; the sampling time; and the type of building. All concentration data are given in micrograms per cubic meter. The following compounds were the most frequently reported: formaldehyde, tetrachloroethylene, 1,1,1-trichloroethane, trichloroethylene, benzene, p-dichlorobenzene, toluene, ethylbenzene, xylenes, decane, and undecane. About 50% of the reported compounds contained 9 carbon atoms or fewer, and 90% had 23 carbon atoms or fewer. Sampling times for the pollutants varied from as little as 15 minutes to as long as 2 weeks. Grab sampling, real time sampling, and integrated sampling methods were used. Odor thresholds for the reported pollutants were, in general, three to five orders of magnitude higher than those measured.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Pollution	Pollution Control	13B
Organic Compounds	Stationary Sources	07C
Data	Data Bases	14G
	Indoor Air	

18. DISTRIBUTION STATEMENT Release to Public	19. SECURITY CLASS *(This Report)* Unclassified	21. NO. OF PAGES 73
	20. SECURITY CLASS *(This page)* Unclassified	22. PRICE

EPA Form 2220-1 (9-73)

ABSTRACT

A data base for concentrations of organic compounds measured indoors has been compiled. Based on a review of the literature from 1979 through 1990, the data base contains information on over 220 compounds ranging in molecular weight from 30 to 446. The compounds are arranged in order of increasing number of carbon atoms - from one to thirty-one. The data base is presented in a 13 column table containing the following information: number of carbon atoms, name of compound, empirical formula, molecular weight, odor threshold (when available), minimum, maximum, median, and mean concentrations, standard deviation, reference number, sampling time, and type of building. All concentration data are given in $\mu g/m^3$. The following compounds were the most frequently reported: formaldehyde, tetrachloroethylene, 1,1,1- trichloroethane, trichloroethylene, benzene, p-dichlorobenzene, toluene, ethylbenzene, xylenes, decane, and undecane. About 50% of the reported compounds contained nine carbon atoms or fewer, and 90% had 23 carbon atoms or fewer. Sampling times for the pollutants varied from as little as 15 minutes to as long as two weeks. Grab-sampling, real time sampling, and integrated sampling methods were used. Odor thresholds for the pollutants reported were, in general, three to five orders of magnitude higher than the measured concentrations.

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INTRODUCTION

Several years ago it was determined that many pollutants found in ambient air were present to a larger extent in indoor air. Thus, it was recognized that indoor air might present problems with regard to potential health effects. Since most of the efforts directed toward ambient air analysis were with respect to the criteria pollutants, it was natural that these pollutants would be the first to be studied in indoor air. In indoor air, pollutants such as carbon dioxide, carbon monoxide, nitrogen oxides, and particulate matter have been extensively studied.

Of the organic compounds, particularly the volatile organic compounds (VOCs), only formaldehyde has been extensively studied in indoor air. Yet many sources of organic compounds in indoor air have their origins in commonly used materials. Such materials include caulking compounds, hair sprays, rug cleaners, and paints and varnishes. In addition, building materials and interior furnishings (such as furniture, floor tile, draperies, and rugs) may be sources of organic compounds.

It was felt that there was a need to develop a data base for concentrations of organic compounds found in indoor air. The initial requirements for such a data base were: (a) It should be computerized in such a manner that additional compounds could easily be added; (b) The organic compounds should be arranged by the number of carbon atoms in the molecule; (c) The data base should contain a reference list; and (d) There should also be a data base listing the sources and potential sources of the organic compounds in the primary data base.

The purpose of this report is to provide workers in the field with a hard copy of the current data base. Since the data base is updated periodically, computer disks are not being made available. Updates to the current report are planned.

DATA BASE DESCRIPTION

Appendix A presents the data base. It contains approximately 220 organic compounds ranging from 1-carbon atom compounds to 31-carbon atom compounds. These compounds range in molecular weight from 30 to 446. The compounds are arranged in order of increasing number of carbon atoms. The data are taken from the references listed in Appendix C. Reference numbers are listed in the column labeled REF in the data base.

The odor threshold values in the fifth column of the primary data base were taken from the following references:

Amoore, J. E., and E. Hautala, "Odor as an Aid to Chemical Safety: Odor Thresholds Compared with Threshold Limit Values and Volatilities for 214 Industrial Chemicals in Air and Water Dilutions," Journal of Applied Toxicology, Vol.3, No. 6, p. 272, 1983.

Fazzalari, F. A., Compilation of Odor and Taste Threshold Values Data, ASTM Data Series DS 48A, American Society for Testing and Materials, Philadelphia, PA, 1978.

Hellman, T. M., and F. H. Small, "Characterization of the Odor Properties of 101 Petrochemicals Using Sensory Methods," Journal of the Air Pollution Control Association, Vol. 24, No. 10, p. 979, 1974.

Leonardos, G., D. Kendall, and N. Barnard, "Odor Threshold Determinations of 53 Odorant Chemicals," Journal of the Air Pollution Control Association, Vol. 19, No. 2, p. 91, 1969.

Ruth, J. H., "Odor Thresholds and Irritation Levels of Several Chemical Substances: A Review," Journal of the American Industrial Hygiene Association, p. A-142, March, 1986.

Summer, W., Odour Pollution of Air: Causes and Control, CRC Press, Cleveland, OH, 1971.

In cases where several odor threshold values are given for the same compound, the values may differ by as much as an order of magnitude. This should not be surprising in view of the subjective judgement required in such tests. Also, different investigators used different test methods and the number of subjects involved varied considerably. In some cases, impurities in the test materials may have altered the results. In many cases, the literature data had to be converted from ppm or ppbv to $\mu g/m^3$.

Minimum, maximum, median, and/or mean concentrations (in $\mu g/m^3$) are presented in the appropriate column. In those cases where compounds were identified but not quantified, all the columns are blank. In most cases, decimal notation is used; for very large and very small numbers, scientific notation is used. The standard deviations of the data are also given, when available.

The column labeled TIME (second from last column) is the sampling time in hours, except where otherwise indicated. In this column, a "D" indicates the time in days and a "W" indicates weeks.

In the column labeled BLDG. TYPE, the type of building investigated is given as follows: A = Apartment; AU = Automobile; CB = Commercial Building; H = Hospital; MH = Mobile Home; NH = Nursing Home; OB = Office Building; R = Residence; S = School; and V = Various types of buildings.

Appendix B contains information on "Sources of Indoor Organic Compounds." It lists substantiated and possible sources for most of the indoor pollutants contained in the data base. The information in Appendix B should be used with some caution, because the composition of materials and products changes over time as manufacturers alter their manufacturing processes and products.

OBSERVATIONS

A review of the data shows concentrations of pollutants ranging from below the quantification level to more than 80,000 $\mu g/m^3$. There is a paucity of data on the standard deviation of concentration values reported in the literature. It is important for users of the data to know the standard deviation in order to know how much confidence to place in the reported values. Other than listing the standard deviation, when reported, this report makes no effort to judge the quality of the data. To do this, the reader should obtain a copy of the reference and use his or her own judgement.

About 50% of the compounds listed contained 9 carbon atoms or fewer; about 90% had 23 carbon atoms or fewer.

The following compounds were the most frequently reported: formaldehyde, tetrachloroethylene, 1,1,1-trichloroethane, trichloroethylene, benzene, p-dichlorobenzene, toluene, ethylbenzene, xylenes, decane, and undecane.

Sampling times for the pollutants varied widely - from as little as 15 minutes to as long as two weeks. Grab sampling, real time sampling, and integrated sampling were used.

Odor thresholds for the pollutants were, in general, three to five orders of magnitude higher than the concentrations actually measured. One cannot, therefore, expect to detect the presence of a pollutant through odor alone.

Appendix A

Indoor Air Quality Data Base of Organic Compounds

(Abbreviations are defined at end of Appendix.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
1	FORMALDEHYDE	CH2O	30	60-200		52		27		1	4-7D	R, A
				1470				78	96	2	6-24	R
								105	114	2	6-24	R
								52	52	2	6-24	R
								40	52	2	6-24	R
						146		112		2	6-24	R
						131		69		2	6-24	R
						319		144		2	6-24	R
						319		75		2	6-24	R
					<13.7	634			2.01	18	1W	MH
					<13.7	526			2.11	18	1W	MH
					16.4	634			1.96	18	1W	MH
					20.3	428			1.73	18	1W	MH
					20.3	416			1.79	18	1W	MH
					31.4	428			1.61	18	1W	MH
								35-237		23	24	OB
								8-166		23	24	R
								48-424		23	24	S
								14-45		23	24	S
								8-166		23	24	
								35-199		23	24	
								49		35	6	OB
								49		9	6	OB

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
1	METHYLENE CHLORIDE	CH2Cl2	85	5.50e+05		288				3	0.25-3	R
				5.40e+05		286				3	0.25-3	R
						5000		670		1	4-7D	R, A
								14.3	9.4	5		R
1	CARBON TETRACHLORIDE	CCl4	154	1.26e+06		14	2.2	2.5	2	4	5-12	V
				3.00e+05				45	16	5		
						12		6.3		1	4-7D	R, A
						25	<4			6	8-168	R
						6	<4			6	8-168	R
						25	<4			6	8-168	R
						11		0.6		17	12	R
						4		0.2		17	12	R
						2		0.3		17	12	R
						1				17	12	R
						0.4				17	12	R
						2		0.5		17	12	R
								45		5		R
					10.13	33.2				5		R
1	CHLOROFORM	CHCl3	119	3.30e+06		200	3.4	8	21	4	5-12	V
				2.50e+05		5.9				3	0.25-3	R
						15		1.9		1	4-7D	R, A
						110	<11			15	5-12	R
						95	<12			15	5-12	R

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
1	CHLOROFORM	CHCl3	119			58	<8			15	5-12	R
						25	<6			15	5-12	R
						53	<11			15	5-12	R
						28	<6			15	5-12	R
						36	<6			15	5-12	R
						210		6.9		17	12	R
						34		4.4		17	12	R
						15		4.5		17	12	R
						6		1.3		17	12	R
						18		1.8		17	12	R
						6		0.8		17	12	R
								43.9	42	5		R
					0.065	3.39				32		R
1	BROMODICHLOROMETHANE	CBrCl2	162							4	5-12	V
1	DIBROMOCHLOROMETHANE	CBr2Cl	207							4	5-12	V
1	DICHLOROMETHANE	CH2Cl2	84		0.56	7.84				32		R
					2.6	32.4				37		OB
1	BROMOFORM	CHBr3	253							4	5-12	V

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
1	TRICHLOROFLUOROMETHANE (F-11)	CCl3F	137	85.7		230		39		1	4-7D	R, A
				28,000	26.6	48				37		OB
2	1,1 DICHLOROETHYLENE	C2H2Cl2	97	4.30e+06				10.7	5.8	5		R
								13	12	5		R
2	TETRACHLOROETHYLENE	C2Cl4	166	3.20e+05		250	5.4	10	26	4	5-12	V
				31,400				18	16	5		
						21				3	0.25-3	R
						21				3	0.25-3	R
						47		18		1	4-7D	R, A
						107		6.3		7	2-3	MH
						49	<2			6	8-168	R
						205	<2			6	8-168	R
						182	<2			6	8-168	R
					<1.0	617	4.5	12		14	2W	R
						11	<2			15	5-12	R
						4	<1			15	5-12	R
						51	<1			15	5-12	CB
						52	<1			15	5-12	CB
						13	<4			15	5-12	H
						8	<4			15	5-12	R
						220	<4			15	5-12	R
						240		6.7		17	12	R

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
2	TETRACHLOROETHYLENE	C2Cl4	166			97		5.9		17	12	R
						67		15		17	12	R
						78		7.5		17	12	R
						53		3		17	12	R
						3		1.7		17	12	R
2	1,1,1-TRICHLOROETHANE	C2H3Cl3	133	2.10e+06		880		50	125	4	5-12	V
						14				3	0.25-3	R
						183				3	0.25-3	R
						60		21		1	4-7D	R, A
					<1.0	264	4.3	7.9		14	2W	R
						260	41			15	5-12	R
						63	24			15	5-12	R
						1000	<6			15	5-12	R
						350	<4			15	5-12	R
						85	<5			15	5-12	R
						26	<5			15	5-12	R
						100	52			15	5-12	R
								14		16		OB
								17		16		OB
								7		16		OB
								40.98		16		OB
								10.69		16		S
								3.09		16		NH

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
2	1,1,1-TRICHLOROETHANE	C2H3Cl3	133				870	48		17	12	R
							110	9.2		17	12	R
							170	36		17	12	R
							170	9.2		17	12	R
							87	9.3		17	12	R
							12	2.8		17	12	R
					13.5	119.7				37		OB
2	TRICHLOROETHANE	C2H3Cl3	133		7.2	58.2				37		OB
2	TRICHLOROETHYLENE	C2HCl3	131	1.35e+06		47	2.3	3.6	5.2	4	5-12	V
								10.2	6.8	5		
						26				3	0.25-3	R
						86		18		1	4-7D	R, A
						11	<2			6	8-168	R
						106	<2			6	8-168	R
						30	<2			6	8-168	R
					<1.0	1200	4.6	13		14	2W	R
						32		1.1		17	12	R
						32		1.3		17	12	R
						7		2.4		17	12	R
						49		2.8		17	12	R

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
2	TRICHLOROETHYLENE	C2HCl3	131			11		1.1		17	12	R
						4		0.8		17	12	R
								10.2		5		R
						35,000				32		OB
					32,000	72,000				32		R
					19,000	81,000				32		R
2	VINYLIDENE CHLORIDE	C2H2Cl2	97	2.00e+06						4	5-12	V
2	1,2-DICHLOROETHANE	C2H4Cl2	99	4.50e+05						4	5-12	V
								12.3	9.6	5		R
								2.06		36	12	H
								1.49		36	12	H
								2.21		36	12	H
								4.51		36	12	OB
2	ETHYLAMINE	C2H7N	45	110		750				10		
				486		1.7				10		
2	ACETIC ACID	C2H4O2	60	38,000		500				10		
				2,500		15.7				10		
					40	244				1	4-7	OB, R

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
2	ACETALDEHYDE	C2H4O	44	1,980		48		17		1	4-7D	R, A
				20				2.1		24	8	OB
2	ETHANOL	C2H6O	46	93,000		767				3	0.25-3	R
				2.07e+05		1374				3	0.25-3	R
						408				3	0.25-3	R
2	N-NITROSO-DIMETHYLAMINE	C2H6N2O	74			0.33		0.17		8		AU
3	PROPANE	C3H8	44	1.80e+06		42				3	0.25-3	R
3	ISOPROPANOL (PROPANOL-2)	C3H8O	60	90,000		140				3	0.25-3	R
						258				3	0.25-3	R
						80				3	0.25-3	R
								6.9		24	8	OB
					14.8	137				37		OB
3	ACETONE (PROPANONE)	C3H6O	58	7.70e+05		157		39		1	4-7D	R, A
				2.12e+05				7.5		24	8	OB
				47,500	28.8	67				37		OB
3	LACTIC ACID	C3H6O3	90	1.60e+05		1.8				10		OB
						0.6				10		OB

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
3	PYRUVIC ACID	C3H4O3	88			5.8				10		OB
						5.1				10		OB
3	1,2-DICHLOROPROPANE	C3H6Cl2	113		45	150				1	4-7D	R
3	1,3-DICHLOROPROPENE	C3H4Cl2	111					52.4	35	5		R
3	DIBROMOCHLOROPROPANE	C3H5Br2Cl	237	96						4	5-12	V
4	ETHYLACETATE	C4H8O2	88	3.58e+05	1.0	204	6.8	12		14	2W	R
				19.6	9	26				1	4-7D	R
								4.8		24	8	OB
4	BUTANE	C4H10	58	15,900		440				3	0.25-3	R
						440				3	0.25-3	R
						408				3	0.25-3	R
						679				3	0.25-3	R
4	ISOBUTANE	C4H10	58			1967				3	0.25-3	R
4	DIETHYLAMINE	C4H11N	73			76				10		OB
4	DIMETHYLACETAMIDE	C4H10ON	88	1.61e+05		4767				10		OB

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
4	1,4-DIOXANE	C4H8O2	88	7.07		4				25	12	R
				10.8		1				25	12	R
4	N-BUTANOL	C4H10O	74	33,000		81		16		7	2-3	MH
				3.25e+05	<1	11	<1	1		14	2W	R
4	I-BUTANOL	C4H10O	74	33,000	<1	20	2	3		14	2W	R
						20				1	4-7D	R
4	BUTANAL	C4H8O	72	788		34		2.7		1	4-7D	R, A
4	2-BUTANONE (MEK)	C4H8O	72	8,400		38		7.9		1	4-7D	R, A
				737	<1.0	25	5.3	6.2		14	2W	R
					5.2	41				37		OB
4	DICHLORVOS (DDVP)	C4H7O4Cl2P	221		0.5	10				21		R
						2.3		0.12		28	24	R
					0.021	1.48		0.085		43	24	R
					0.001	0.002		0.003		43	24	R
4	2-ETHOXY-ETHANOL (CELLOSOLVE)	C4H10O2	90	220	8	60				1	4-7D	R
				2,040								
4	CHLOROETHYL VINYL ETHER	C4H7ClO	106					25.1	16	5		R

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
4	N-NITROSOMORPHOLINE	C4H8NO2	102			0.6		0.13		8		AU
5	PENTANE	C5H12	72	6,600		102				3	0.25-3	R
						327				3	0.25-3	R
						36				3	0.25-3	R
						423				3	0.25-3	R
5	I-AMYL ALCOHOL	C5H12O	78	35,000	<1	10	<1	1		3		
				25,200						3		
5	PROPYL ACETATE	C5H10O2	102	210				0.8		24	8	OB
5	2-METHYL BUTANE (ISOPENTANE)	C5H12	72			165				3	0.25-3	R
						1224				3	0.25-3	R
						117				3	0.25-3	R
						699				3	0.25-3	R
					31.9	81.6				37		OB
5	2-PENTANONE	C5H10O	86				0.037			31		
6	N-HEXANE	C6H14	86	5.50e+05		39				3	0.25-3	R
						79				3	0.25-3	R
						11				3	0.25-3	R
						240				3	0.25-3	R

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
6	N-HEXANE	C6H14	86			590		71		1	4-7D	R, A
						338	5			6	8-168	R
						107	4			6	8-168	R
						178	3			6	8-168	R
					2	46	7.9	9.0		14	2W	R
								19		24	8	OB
					10	24				37		OB
6	CYCLOHEXANE	C6H12	84	1,190		26	2			6	8-168	R
				1,440		22	1			6	8-168	R
						355	1			6	8-168	R
					<1.0	29	6.8	7.4		14	2W	R
6	CYCLOHEXANONE	C6H10O	98	526	1	6				1	4-7D	R
				480								
6	2-HEXANONE (N-BUTYL KETONE)	C6H12O	100					0.87		24	8	OB
6	HEXANAL	C6H12O	100	39		53		10		1	4-7D	R, A
					<1.0	11	1	2		13		
6	4-METHYL-2-PENTANONE	C6H12O	102	2,100	<1.0	12	<1.0	1.0		14	2W	R

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
6	METHYLCYCLOPENTANE	C6H12	84			273				3	0.25-3	R
					2.1	79	13	15		14	2W	R
6	2-METHYLPENTANE (ISOHEXANE)	C6H14	86	289		47				3	0.25-3	R
						104				3	0.25-3	R
						36				3	0.25-3	R
						552				3	0.25-3	R
								2.1		24	8	OB
6	3-METHYLPENTANE	C6H14	86			54				3	0.25-3	R
						7				3	0.25-3	R
						190				3	0.25-3	R
							3			6	8-168	R
						101	3			6	8-168	R
						52	2			6	8-168	R
								1.5		24	8	OB
6	BENZENE	C6H6	78	1.80e+05		120	13	20	22	4	5-12	V
				4,500				9.4	4.1	5		
						140				3	0.25-3	R
						176				3	0.25-3	R
						78				3	0.25-3	R
						6338				3	0.25-3	R
						204		52		1	4-7D	R, A
						24	7			6	8-168	R

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
6	BENZENE	C6H6	78			148	7			6	8-168	R
						53	5			6	8-168	R
					<1.0	39	7.8	9.3		14	2W	R
						120		12		17	12	R
						51		2.6		17	12	R
						42		15		17	12	R
						40		1.6		17	12	R
						27		4.9		17	12	R
						21		4.5		17	12	R
								9.4	4.1	5		R
								1.55		36	12	H
								2.13		36	12	H
								2.88		36	12	H
								2.74		36	12	OB
								4.95		36	12	OB
								1.70		36	12	NH
								2.44		36	12	NH
								5.61		36	12	OB
								4.50		36	12	S
								3.13		36	12	NH
6	CHLOROBENZENE	C6H5Cl	112	1,050						4	5-12	
								5.8	4.8	5		
						3	<0.4			6	8-168	R

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
6	CHLOROBENZENE	C6H5Cl	112			<0.4	<0.4			6	8-168	R
						27	<0.4			6	8-168	R
6	O-DICHLOROBENZENE	C6H4Cl2	147	12,000						4	5-12	V
								33	52	5		
						1.2		0.6		7	2-3	MH
6	M-DICHLOROBENZENE	C6H4Cl2	147							4	5-12	V
								13	3.9	5		
						8.5		1.6		7	2-3	MH
						6.0	<0.6			6	8-168	R
						9.0	<0.6			6	8-168	R
						6.0	<0.6			6	8-168	R
6	P-DICHLOROBENZENE	C6H4Cl2	147	90,000		686				3	0.25-3	R
						1005				3	0.25-3	R
						172				3	0.25-3	R
						230		55		1	4-70	R, A
						59		7.9		7	2-3	MH
						299	<0.6			6	8-168	R
						138	2.0			6	8-168	R
						240	<0.6			6	8-168	R
						28	<22			15	5-12	R
						12	<2			15	5-12	R

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
6	P-DICHLOROBENZENE	C6H4Cl2	147			470	<3			15	5-12	R
						500	<2			15	5-12	R
						84	<4			15	5-12	R
						59	<6			15	5-12	R
						67	<1			15	5-12	R
6	M,P-DICHLOROBENZENE	C6H4Cl2	147			1200	3.4	41	150	4	5-12	V
					<1.0	1270	4.7	22		14	2W	R
						910		40		17	12	R
						1500		44		17	12	R
						120		14		17	12	R
						190		15		17	12	R
						170		14		17	12	R
						7		0.9		17	12	R
6	1,2,3-TRICHLOROBENZENE	C6H3Cl3	181			3	<0.8			6	8-168	R
						3	<0.8			6	8-168	R
						28	<0.8			6	8-168	R
6	1,2,4-TRICHLOROBENZENE	C6H3Cl3	181			5	<0.8			6	8-168	R
						15	<0.8			6	8-168	R

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
6	1,3,5-TRICHLOROBENZENE	C6H3Cl3	181			33	<0.8			6	8-168	R
							<0.8			6	8-168	R
						8	<0.8			6	8-168	R
						5	<0.8			6	8-168	R
6	HEXACHLOROBENZENE	C6Cl6	285			0.021		0.00126		28	24	R
6	TETRACHLOROPHENOL	C6H2Cl4O	231							29		R
6	GAMMA-BHC	C6H6Cl6	291			0.245		0.0202		28	24	R
6	2-ETHOXYETHYLACETATE	C6H12O3	132	300				2.16		16	12	CB
								9.58		16	12	CB
								1.31		16	12	CB
								1.67		16	12	CB
6	PENTACHLOROPHENOL	C6HCl5O	266					3.1		22	3-8	OB
								38		22	3-8	OB
6	ALPHA-BHC	C6H6Cl6	291			0.032		0.0012		28		
6	ISO-BUTYLACETATE	C6H12O2	116	2,180		100				1	4-7D	R
				17,000	1.0	33	1.0	2.0		14	2W	R

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
6	BUTYLACETATE	C6H12O2	116	33,100	5	34				1	4-7D	R
				35,000				1.4		24	8	OB
				38,000	1.0	204	3.1	6.1		14	2W	R
								2.63		16		OB
								1.48		16		S
										16		NH
								6.34		36	12	OB
								1.22		36	12	N
								2.63		36	12	OB
								1.48		36	12	S
7	TOLUENE	C7H8	92	1.40e+05						4	5-12	V
				44,000				27	15.6	5		
				8,030		58		27		2	6-24	R
				17,600				62	96	5		
						655		62		2	6-24	R
								41	27	5		
						84				3	0.25-3	R
						314				3	0.25-3	R
						50				3	0.25-3	R
						272				3	0.25-3	R
						378		128		1	4-7D	R, A
						40		9		7	2-3	MH
						526	23			6	8-168	R

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
7	TOLUENE	C7H8	92			697	40			6	8-168	R
						2252	43			6	8-168	R
					11	578	62	76		14	2W	R
								27.2		5		R
								96.1		5		R
7	BUTYL ACRYLATE	C7H1202	128	31.4		48				10		OB
				11		17				10		OB
7	METHYLCYCLOHEXANE	C7H14	98	2.00e+06		33	2			6	8-168	R
						50	1			6	8-168	R
						504	1			6	8-168	R
					1.1	51	3.6	5.5		14	2W	R
								1.1		24	8	OB
7	HEPTANE (3-METHYLHEXANE)	C7H16	100	9.30e+05		76		16		1	4-7D	R, A
				4.40e+05		30	3			6	8-168	R
				2.00e+05		68	3			6	8-168	R
						556	2			6	8-168	R
					1.5	82	8	7		14	2W	R
								7.8		24	8	OB
					3.1	12.6				37		OB
					4.0	14.7				37		OB

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
7	1-HEPTENE (a-HEPTYLENE)	C7H14	98		3.2	15.5				38	4	OB
7	2-METHYLHEXANE	C7H16	100			19	3			6	8-168	R
						54	2			6	8-168	R
						278	2			6	8-168	R
								0.5	0.2	39	6W	CB
						14	2			6	8-168	R
						44	2			6	8-168	R
						233	1			6	8-168	R
								0.5	0.2	39	6W	CB
7	DIMETHYLCYCLOPENTANES	C7H14	98			9	<1			6	8-168	R
						13	<1			6	8-168	R
						148	<1			6	8-168	R
7	BENZALDEHYDE	C7H6O	106	3,700	2	30				1	4-7D	R
				8				17.8	35	5		R
								20.7	28	5		R
8	ETHYLBENZENE	C8H10	106	400		320	5.9	13	34	4	5-12	V
				8,700				4.4	3.2	5		
						12		4.4		2	6-24	R
								10.5	21	5		
						161		10.5		2	6-24	R

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
8	ETHYLBENZENE	C8H10	106			22				3	0.25-3	R
						35				3	0.25-3	R
						109		27		1	4-7D	R, A
						117	2			6	8-168	R
						45	3			6	8-168	R
						138	2			6	8-168	R
					1.5	161	6.6	10		14	2W	R
						65	<4			15	5-12	R
						19	<3			15	5-12	R
						17	<3			15	5-12	R
						12	<3			15	5-12	R
						27	<4			15	5-12	R
						50	<4			15	5-12	R
						800	<5			15	5-12	R
								53		16		OB
								54		16		OB
								47		16		OB
								10.2		16		OB
								2.69		16		S
								0.97		16		NH
						310		8.8		17	12	R
						170		6.1		17	12	R
						28		7.5		17	12	R
						22		-0.7		17	12	R

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
8	ETHYLBENZENE	C8H10	106			33		2.2		17	12	R
						9		2.4		17	12	R
								4.4	3.2	5		R
								10.5	21	5		R
8	STYRENE	C8H8	104	2,100		54		3.1	5.9	4	5-12	V
				430		36		3.0		7	2-3	MH
				202	<1.0	41	1.2	2.5		14	2W	R
						53		1.9		17	12	R
						9		1.5		17	12	R
						10		1.9		17	12	R
						6				17	12	R
						2		0.4		17	12	R
						4		0.3		17	12	R
					<1	9				1	4-7D	R
								1.00		36	12	H
								1.07		36	12	H
								1.33		36	12	H
								2.52		36	12	OB
								2.87		36	12	OB
								2.99		36	12	N
								1.27		36	12	N
								2.36		36	12	OB
								1.32		36	12	S

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
8	STYRENE	C8H8	104					1.19		36	12	N
8	XYLENES	C8H10	106	1.00e+05		2076				10		OB
				348		155				10		OB
						159	9			6	8-168	R
						178	12			6	8-168	R
						753	10			6	8-168	R
						120		8.1		17	12	R
						150		10		17	12	R
						51		16		17	12	R
						41				17	12	R
						85		7.6		17	12	R
						26		7.7		17	12	R
								16.6	15	5		R
								44.2	91	5		R
8	O-XYLENE	C8H10	106	4,600		49	5.2	7.8	8.6	4	5-12	V
						35				3	0.25-3	R
						18				3	0.25-3	R
						1312				3	0.25-3	R
						132		26		1	4-7D	R, A
						112		9.1		7	2-3	MH
					1.2	45	4.9	7.0		14	2W	R
						47	<6			15	5-12	R

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
8	O-XYLENE	C8H10	106			18	<5			15	5-12	R
						24	<6			15	5-12	R
						14	<5			15	5-12	R
						18	<5			15	5-12	R
						54	<6			15	5-12	R
						420	<7			15	5-12	R
						44		3.0		17	12	R
						94		5.2		17	12	R
						19		6.3		17	12	R
						26		0.2		17	12	R
						27		2.3		17	12	R
						11		3.2		17	12	R
8	M,P-XYLENE	C8H10	106			120	15	21	24	4	5-12	V
								17	15	5		
						54		17		2	6-24	R
								44	91	5		
						697		44		2	6-24	R
						13				3	0.25-3	R
						106				3	0.25-3	R
						40				3	0.25-3	R
						265				3	0.25-3	R
						390				1	4-7D	R, A
						345				7		

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
8	M,P-XYLENE	C8H10	106		3.3	304	16	23		14	2W	R
						170	20			15	5-12	R
						51	<8			15	5-12	R
						74	15			15	5-12	R
						46	17			15	5-12	R
						75	11			15	5-12	R
						150	17			15	5-12	R
						1200	13			15	5-12	R
8	M-XYLENE	C8H10	106	830						4	5-12	V
						35				3	0.25-3	R
						2261				3	0.25-3	R
								6.88		36	12	H
								3.13		36	12	H
								9.91		36	12	H
								41.53		36	12	OB
								15.05		36	12	OB
								23.8		36	12	NH
								5.33		36	12	NH
								27.11		36	12	OB
								8.72		36	12	S
								2.95		36	12	NH

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
8	P-XYLENE	C8H10	106	3,100		18				3	0.25-3	R
						769				3	0.25-3	R
8	DIMETHYL BENZENE (1,2)	C8H10	106		8.7	26				37		OB
8	DIMETHYL BENZENE (1,3-1,4)	C8H10	106		18.1	54.5				37		OB
8	1-OCTENE (a-OCTYLENE)	C8H16	124			2.1				38	4	OB
8	ISOOCTANE (2-METHYL-HEPTANE)	C8H18	114	1.00e+05		62				3	0.25-3	R
								1.8		24	8	OB
					1.8	8				37		OB
8	N-OCTANE (TRIMETHYL PENTANE)	C8H18	114	7.10e+05		65		14		1	4-7D	R, A
				1.00e+05		36	1			6	8-168	R
				7.25e+05		60	2			6	8-168	R
						533	1			6	8-168	R
					<1.0	64	2.8	4.9		14	2W	R
						36		1.9		17	12	R
						19		2.1		17	12	R
						2		1.0		17	12	R
								1.8		24	8	OB
					1.8	8				37		OB

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
8	2-BROMOOCTANE (OCTYL BROMIDE)	C8H17Br	193					1.1		24	8	OB
8	2-ETHYLHEXANOL	C8H18O	113	399	<1	10	<1	2		14	2W	R
8	RONNEL	C8H8O3Cl3PS	322		0.2	2				21		R
						0.02		1.6E-4		28	24	R
8	2,4 - D	C8H6Cl2O3	221			0.048		0.0018		28	24	R
8	CHLOROTHALONIL	C8Cl4N2	266			0.264		0.00591		28	24	R
8	ATRAZINE	C8H14ClN5	216							28	24	R
8	DIMETHYLCYCLOHEXANE	C8H16	122		3.1					37		OB
								1.3		39	6W	CB
8	METHYL-METHYL-ETHENYL-CYCLOHEXENE	C8H17	115				0.351			31		
8	ETHENYL BENZENE	C8H8	104				0.146			31		
8	DIMETHYLBENZENE	C8H10	106				0.782			31		
8	TRIMETHYL-PENTANEDIOL	C8H18O2	146				0.236			31		

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
9	NONANE	C9H20	128	3.40e+06		75				3	0.25-3	R
				60,000		165		27		1	4-7D	R, A
				3.41e+06		278	3			6	8-168	R
						269	4			6	8-168	R
						407	6			6	8-168	R
						98		10.6		2	6-24	R
						36		6.4		2	6-24	R
					<1.0	101	4.2	9.7		14	2W	R
					10.6	149				37		OB
9	2,5-DIMETHYL-HEPTANE	C9H20	128					1.6		24	8	OB
9	ETHYL TOLUENE	C9H12	120			20				3	0.25-3	R
						40				3	0.25-3	R
9	2-ETHYL TOLUENE	C9H12	120		0.8	1.3				38	4	OB
9	3-ETHYL TOLUENE	C9H12	120		12	25.5				38	4	OB
9	4-ETHYL TOLUENE	C9H12	120		7.3	7.5				38	4	OB
9	TRIMETHYLCYCLOHEXANE (1,3,5)	C9H22	130			4,600		1,200		37	24	R

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
9	METHYL ETHYL CYCLOHEXANE	C9H18	126					3.8	0.3	39	6W	CB
								3.0	0.2	39	6W	CB
9	O-ETHYLTOLUENE	C9H12	120			185				3	0.25-3	R
								0.66		36	12	H
								8.89		36	12	OB
								2.08		36	12	OB
								4.01		36	12	N
								0.73		36	12	N
								1.60		36	12	OB
								0.74		36	12	S
9	M,P-ETHYLTOLUENE	C9H12	120			405				3	0.25-3	R
9	M-ETHYLTOLUENE	C9H12	120					25		16		OB
								31		16		OB
								26		16		OB
								6.07		16		OB
								2.62		16		S
								0.9		16		NH
9	CUMENE	C9H12	120	147		30				3	0.25-3	R
				39		7		2.2		2	6-24	R
						13		1.3		2	6-24	R

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
9	CUMENE	C9H12	120					10.6	25	5		R
								6.4	6.8	5		R
9	QUINOLINE	C9H7N	129	40,900		0.0013		0.015		11	8	R
						0.031		0.0012		11	8	R
9	ISOQUINOLINE	C9H7N	129			0.014		0.00093		11	8	R
						0.001		0.01		11	8	R
9	INDANE (HYDRINDENE)	C9H10	118			20				1	4-7D	R
9	1,2,3 TRIMETHYLBENZENE	C9H12	120			185				3	0.25-3	R
						24	<0.3			6	8-168	R
						40	1			6	8-168	R
						16	<0.3			6	8-168	R
					<1.0	83	1.9	3.5		14	2W	R
9	1,2,4 TRIMETHYLBENZENE	C9H12	120	450		20				3	0.25-3	R
						50				3	0.25-3	R
						975				3	0.25-3	R
						150				1	4-7D	R, A
						165	4			6	8-168	R
						276	6			6	8-168	R
						400	5			6	8-168	R

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
9	1,2,4 TRIMETHYLBENZENE	C9H12	120		<1.0	312	5.4	11		14	2W	R
								72		16		OB
								92		16		OB
								56		16		OB
								6.28		16		OB
								2.8		16		S
								0.98		16		NH
9	1,3,5 TRIMETHYLBENZENE (MESITYLENE)	C9H12	120	4,500		59		13		1	4-7D	R, A
						37	1			6	8-168	R
						99	2			6	8-168	R
						93	2			6	8-168	R
						2		1.4		2	6-24	R
						39		6.7		2	6-24	R
					<1.0	111	2	3.9		14	2W	R
								1.4	0.7	5		R
								6.7	9.2	5		R
					4.1					37		OB
9	N-PROPYLBENZENE	C9H12	120	100		18	<0.3			6	8-168	R
						27	1.0			6	8-168	R
						15	0.4			6	8-168	R
								5.0		36	12	OB
								1.13		36	12	OB

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
9	N-PROPYLBENZENE	C9H12	120					2.99		36	12	N
								0.70		36	12	N
								1.22		36	12	N
								0.56		36	12	S
9	I+N-PROPYLBENZENE	C9H12	120		<1.0	89	3	4.5		14	2W	R
9	ISOPROPYLBENZENE	C9H12	120	120		5	<0.3			6	8-168	R
						11	0.3			6	8-168	R
						10	<0.3			6	8-168	R
								0.31		36	12	H
								0.33		36	12	H
								3.94		36	12	OB
								0.67		36	12	OB
								2.27		36	12	N
								0.33		36	12	N
								0.79		36	12	OB
								0.36		36	12	S
9	O-METHYLETHYLBENZENE	C9H12	120	1,000		51	1.0			6	8-168	R
						72	2.0			6	8-168	R
						156	1.0			6	8-168	R
					<1.0	103	2.3	4.4		14	2W	R

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
9	M-METHYLETHYLBENZENE	C9H12	120	1,000		82	3.0			6		R
						166	3.0			6		R
						227	3.0			6		R
9	P-METHYLETHYLBENZENE	C9H12	120	1,000		54	1.0			6		R
						77	2.0			6		R
						94	2.0			6		R
9	O+P-METHYLETHYLBENZENE	C9H12	120		<1.0	229	5.0	8.9		14	2W	R
9	NONANAL	C9H18O	142	374		82		12		1	4-7D	R, A
						44		13		7	2-3	MH
9	1-NONENE (NONYLENE)	C9H18	126			0.2				38	4	OB
9	CHLORPYRIFOS	C9H11Cl3NO3PS	351		0.023	2.2	0.17	0.47		19	24	R
					0.51	34.6				20		R
					0.014	15		2.4		27	24	R
						2.2	0.17	0.36		28	24	R
					0.118	0.28		0.198		43	24	R
					0.006	0.007		0.00650		43	24	R
9	CAPTAN	C9H8CL3NO2S	301			0.044		0.00185		28	24	R

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
9	FOLPET	C9H4Cl3NO2S	297			0.074		0.00678		28	24	R
10	DECANE	C10H22	142	11,000		18				3	0.25-3	R
						148				3	0.25-3	R
						1100		92		1	4-7D	R, A
						807	8.0			6	8-168	R
						433	9.0			6	8-168	R
						905	14			6	8-168	R
						39		12		2	6-24	R
						81		8.9		2	6-24	R
					<1.0	136	6.8	14		14	2W	R
						150	21			15	5-12	R
						64	18			15	5-12	R
						110	<7			15	5-12	R
						38	<6			15	5-12	R
						17	<3			15	5-12	R
						49	<8			15	5-12	R
						350	13			15	5-12	R
								420		16		OB
								520		16		OB
								370		16		OB
								2.26		16		OB
								5.98		16		S
								1.87		16		NH

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
10	DECANE	C10H22	142			8				17	12	R
						16		1.5		17	12	R
						21		0.7		17	12	R
								12.4	12	5		R
								8.9	12	5		R
10	N-BUTYLBENZENE	C10H14	134			30	0.8			6	8-168	R
						40	0.9			6	8-168	R
						20	1.0			6	8-168	R
10	1,2 DIETHYLBENZENE	C10H14	134		0.2	3.5				38	4	OB
10	1,3-DIETHYLBENZENE	C10H14	134			0.5				38	4	OB
10	1,2,3,5-TETRAMETHYLBENZENE	C10H14	134			1.7				38	4	OB
10	1,2,4,5-TETRAMETHYLBENZENE	C10H14	134			3.1				38	4	OB
10	P-METHYLISOPROPYLBENZENE	C10H14	134			11	0.6			6	8-168	R
						32	0.7			6	8-168	R
						10	1.0			6	8-168	R

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
10	LIMONENE	C10H16	136	56		23				3	0.25-3	R
				10		232				3	0.25-3	R
						34				3	0.25-3	R
						480		140		1	4-7D	R, A
						165		12		7	2-3	MH
						773	18			6	8-168	R
						216	26			6	8-168	R
						693	45			6	8-168	R
						24		10.3		2	6-24	R
						167		20.8		2	6-24	R
					<1.0	315	11	25		14	2W	R
								10.3	7.9	5		R
								20.8	32	5		R
10	PINENE	C10H16	136	847		23				3	0.25-3	R
10	α-PINENE	C10H16	136	16		605		102		1	4-7D	R, A
						77		13		7	2-3	MH
					<1.0	97	7.7	11		14	2W	R
								15		16		OB
								15		16		OB
								12		16		OB
										16		OB
								2.65		16		S

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
10	a-PINENE	C10H16	136							16		NH
						39		5.0		17	12	R
						29		4.0		17	12	R
						3		1.2		17	12	R
10	b-PINENE	C10H16	136			104		17		1	4-7D	R, A
					<1.0	11	<1.0	1.3		14	2W	R
10	a-TERPINENE	C10H16	136	2,330	<1.0	37	2.9	4.1		14	2W	R
						1.0				38	4	OB
10	CAMPHENE	C10H16	136	1.00e+05		278		25		7	2-3	MH
						1.4				38	4	OB
10	CAMPHOR	C10H16O	152	8,750	3	14				1	4-7D	R
				7,800								
10	NAPHTHALENE (TETRALIN)	C10H12	132	38,800		37				3	0.25-3	R
				1,500		70		11		1	4-7D	R, A
						63			9.4	7	2-3	MH
						4	<0.3			6	8-168	R
						14	<0.3			6	8-168	R
						7	<0.3			6	8-168	R
						75		9.4		2	6-24	R

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
10	NAPHTHALENE (TETRALIN)	C10H12	132			675		17.5		2	6-24	R
					<1.0	14	2.1	2.3		14	2W	R
					1	80				1		R
								9.4	21	5		R
								17.5	76	5		R
10	CHLORDANE	C10H6Cl8	410	26.7		6	3.3			12	4	R
				8.4	0.23	5.6		1.6		19	24	R
								2.75	1.33	12	4	R
								4.7	2.65	12	4	R
								4.48	3.94	12	4	R
								2.80	3.32	12	4	R
								3.32	1.38	12	4	R
								5.01	0.97	12	4	R
								0.30	0.28	12	4	R
								1.61	1.13	12	4	R
								4.48	1.70	12	4	R
								2.39	2.05	12	4	R
								3.32	1.06	12	4	R
								2.34	0.78	12	4	R
								5.81	5.01	12	4	R
								2.77	2.69	12	4	R
					3.00	87.7				20		R
					0.191	0.212		0.206		43	24	R

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
10	CHLORDANE	C10H6Cl8	410		0.036	0.253		0.144		43	24	R
10	MALATHION	C10H17O6PS2	330	14,700	3.00	130		5.06		20		R
				13,500	0.1	10				21		R
					0.2	2				21		R
								0.021		28	24	R
10	DACTHAL	C10H6Cl4O4	332					0.00042		28	24	R
						1.7		0.51		27	24	R
10	EUCALYPTOLE (CINEOLE)	C10H18O	154			35				1	4-7D	R
						3.0	0.076	0.324		28	24	R
10	HEPTACHLOR	C10H5Cl7	370	333		2	1.2			12	4	R
				306	0.016	1.6		0.4		19	24	R
								0.01	0.01	12	4	R
								1.41	0.64	12	4	R
								1.05	0.41	12	4	R
								1.18	0.28	12	4	R
								1.27	0.24	12	4	R
								1.80	1.47	12	4	R
								1.00	0.47	12	4	R
						0.31		0.088		27	24	R
						1.6		0.16		28	24	R

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
10	HEPTACHLOR	C10H5Cl7	370		0.064	0.134		0.099		43	24	R
					0.005	0.035		0.02		43	24	R
10	NICOTINE	C10H14N2	162	3.08e+06				~0.0003		13	168	OB
								~0.0006		13	168	OB
						14				10		OB
						<0.022				10		OB
10	a-DECYLENE (DECENE-1)	C10H20	140		1.0	75.8				38	4	OB
10	p-CYMENE	C10H14	134		0.4	84				38	4	OB
11	UNDECANE	C11H24	156	23,000		59				3	0.25-3	R
						950		80		1	4-7D	R, A
						41			4.3	7	2-3	MH
						229	3.0			6	8-168	R
						191	5.0			6	8-168	R
						445	9.0			6	8-168	R
						38		8.2		2	6-24	R
						115		12		2	6-24	R
					<1.0	88	5.7	10		14	2W	R
						280	32			15	5-12	R

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
11	UNDECANE	C11H24	156			120	30			15	5-12	R
						63	<4			15	5-12	R
						31	<5			15	5-12	R
						11	<3			15	5-12	R
						11	<3			15	5-12	R
						140	10			15	5-12	R
								210		16		OB
								220		16		OB
								200		16		OB
								2.85		16		OB
								6.77		16		S
										16		NH
						9		1.1		17	12	R
						72		3.6		17	12	R
						15		2.6		17	12	R
								8.2	9	5		R
								12.0	18	5		R
11	1-METHYLNAPHTHALENE	C11H10	142			0.5	<0.3			6	8-168	R
						2.0	<0.3			6	8-168	R
						0.9	<0.3			6	8-168	R
					2	6				1	4-7D	R

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
11	2-METHYLNAPHTHALENE	C11H10	142	95		7		2.5		2	6-24	R
				58		17		2.6		2	6-24	R
					10	14				1	4-7D	R
								2.5	1.9	5		R
								2.6	4.2	5		R
11	PROPOXUR	C11H15NO3	209		0.047	7.9		0.7		19	24	R
						0.66		0.23		27	24	R
						7.92	0.093	0.528		28	24	R
					0.141	0.316		0.239		43	24	R
					0.011	0.016		0.014		43	24	R
11	BENDIOCARB	C11H13NO4	223			1.5		0.086		28	24	R
12	DODECANE	C12H26	170	37,000		220		20		1	4-7D	R, A
						40	1			6	8-168	R
						118	2			6	8-168	R
						96	4			6	8-168	R
						10		4.2		2	6-24	R
						675		13.7		2	6-24	R
					<1.0	35	3.7	5.6		14	2W	R
						9		1.7		17	12	R
						54		3.1		17	12	R
						4		1.1		17	12	R

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
12	DODECANE	C12H26	170					4.2	3	5		R
								13.7	74	5		R
12	DIAZINON	C12H21N2O3PS	304		0.059	13.7		1.1		19	24	R
					0.51	34.6		2.5		20		R
					0.2	2				21		R
						8.8		1.4		27	24	R
						13.7	0.073	0.42		28	24	R
					0.089	0.322		0.206		43	24	R
					0.001	0.01		0.0055		43	24	R
12	ALDRIN	C12H8Cl6	365	253	1.40	1.55		1.48		20		R
								0.3		26		R
								0.12		26		R
								1.4		26		R
								1.03		26		R
						1.84		0.031		28		R
12	ORTHO-PHENYLPHENOL	C12H10O	170			1.04	0.062	0.096		28	24	R
					0.04	0.08		0.06		43	24	R
					0.027	0.043		0.07		43	24	R
12	4-PHENYLCYCLOHEXENE (4-PC)	C12H14	158	2.1	<0.1	70				30		A, OB

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
12	UNDECENE-1 (UNDECYLENE-a)	C12H22	166			0.8				38	4	OB
12	LAURIC ACID	C12H24O2	200	2.68e+06				0.0015		33	84	OB
13	TRIDECANE	C13H28	184			20		3.1		1	4-7D	R, A
						13	1			6	8-168	R
						18	1			6	8-168	R
						38	2			6	8-168	R
						5		2.3		2	6-24	R
						113		16.5		2	6-24	R
					<1.0	79	4.7	6.3		14	2W	R
								2.3	1.3	5		R
								16.5	25	5		R
					6.0	112				37		OB
13	TRIDECANOIC ACID (TRIDECYLIC)	C13H26O2	214					0.0005		33	84	OB
14	MYRISTIC ACID (TETRADECANOIC)	C14H28O2	228	1.02e+06				0.006		33	84	OB
								0.0005		33	84	OB
14	TETRADECANE	C14H30	198			57				7	2-3	MH
						7				6	8-168	R
						8				6	8-168	R
						46				6	8-168	R

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
14	TETRADECANE	C14H30	198			5				2	6-24	R
						75				2	6-24	R
								7.5	10	5		R
								3.2	1.3	5		R
					36.1	245				37		OB
14	PHENANTHRENE	C14H10	178			0.072		0.06		11	8	R
						0.13		0.1		11	8	R
14	ANTHRACENE	C14H10	178			0.0037		0.0029		11		
						0.0081		0.0058		11		
15	PENTADECANE	C15H32	212			3	0.9			6	8-168	R
						4	1.0			6	8-168	R
						5	2.0			6	8-168	R
						5		2.8		2	6-24	R
						12		1.9		2	6-24	R
								2.8		5		R
								1.9	2.4	5		R
15	NONYLPHENOL ISOMERS	C15H24O	220					~0.030		13	168	OB
								~0.015		13	168	OB

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
15	PENTADECANOIC ACID	C15H30O2	242					0.002		33	84	OB
								0.0001		33	84	OB
16	DIBUTYLPHTHALATE	C16H22O4	278					~0.0002		13	168	OB
16	HEXADECANE	C16H34	226			2	0.8			6	8-168	R
						3	0.3			6	8-168	R
						4	1.0			6	8-168	R
						5		3.7		2	6-24	R
						21		3.8		2	6-24	R
								3.7		5		R
								3.8	4.7	5		R
16	HEXADECANE (BRANCHED)	C16H34	226					~0.0002		13	168	OB
								~0.004		13	168	OB
16	FLUORANTHENE	C16H10	202			~0.023		~0.016		11	8	R
						~0.037		~0.028		11	8	R
16	PYRENE	C16H10	202			0.011		0.0075		11	8	R
						0.018		0.013		11	8	R
16	1-NITROPYRENE	C16H9O2N	247			6.90e-05		2.60e-05		11	8	R

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
16	3-NITROFLUORANTHENE	C16H9O2N	247			0.00014		6.00e-05		11	8	R
16	PALMITIC ACID	C16H32O2	256	1.14e+08				0.05		33	84	OB
								0.008		33	84	OB
17	HEPTADECANOIC ACID (MARGARIC)	C17H34O2	270					0.003		33	84	OB
								0.0001		33	84	OB
17	OLEIC ACID	C17H34O2	282					0.0035		33	84	OB
								0.0002		33	84	OB
18	CHRYSENE	C18H12	228			0.0014		0.0012		11	8	R
						0.003		0.0052		11	8	R
18	CYCLOPENTA(C,D)PYRENE	C18H10	226			0.00069		0.00062		11	8	R
						0.00052		0.00029		11	8	R
18	BENZO(A)ANTHRACENE	C18H12	228			0.00067		0.00064		11	8	R
						0.0022		0.0013		11	8	R
18	STEARIC ACID	C18H36O2	284	1.90e+08				0.045		33	84	OB
								0.005		33	84	OB

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
19	BUTYLBENZYLPHTHALATE	C19H2O4	312					~0.020		13	168	OB
								~0.001		13	168	OB
19	NONADECANOIC ACID	C19H38O2	298					0.002		33	84	OB
20	ABIETIC ACID (SYLVIC)	C20H30O2	302					0.001		33	84	OB
20	BENZOFLUORANTHENES	C20H12	252			0.0018		0.0016		11	8	R
						0.0058		0.0034		11	8	R
20	BENZO(A)PYRENE	C20H12	252			0.0011		0.00092		11	8	R
						0.0033		0.002		11	8	R
20	BENZO(E)PYRENE	C20H12	252			0.001		0.00091		11	8	R
						0.0031		0.002		11	8	R
20	ARACHIDIC ACID (EICOSANOIC)	C20H40O2	313					0.011		33	84	OB
21	HENEICOSANOIC ACID	C21H42O2	326					0.006		33	84	OB
22	DIHEPTYLPHTHALATE	C22H34O4	362					~0.001		13	168	OB
22	BEHENIC ACID (DOCOSANOIC)	C22H44O2	341					0.013		33	84	OB
								0.0003		33	84	OB

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
22	INDENO(1,2,3-C,D)PYRENE	C22H12	276			0.0009		0.0008		11	8	R
						0.0026		0.0015		11	8	R
23	N-TRICOSANE	C23H48	325					~0.002		13	168	OB
								~0.003		13	168	OB
24	N-TETRACOSANE	C24H50	339					~0.003		13	168	OB
								~0.004		13	168	OB
24	DI(2-ETHYLHEXYL)PHTHALATE	C24H38O4	390					~0.055		13	168	OB
								~0.020		13	168	OB
24	TRIS(2-ETHYLHEXYL)PHOSPHATE	C24H51O4P	434					~0.006		13	168	OB
24	LIGNOCERIC ACID	C24H48O2	369					0.0065		33	84	OB
24	BENZO(G,H,I)PERYLENE	C24H14	302			0.0017		0.0015		11	8	R
						0.0028		0.0022		11	8	R
24	CORONENE	C24H12	300			0.0031		0.0014		11	8	R
						0.0017		0.0013		11	8	R
24	TRICOSANOIC ACID	C24H48O2	368					0.0055		33	84	OB

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
25	N-PENTACOSANE	C25H52	353					~0.004		13	168	OB
25	BIS(2-ETHYLHEXYL)AZELATE	C25H48O4	413					~0.008		13	168	OB
								~0.010		13	168	OB
26	DINONYL PHTHALATE	C26H42O4	418					~0.015		13	168	OB
26	PENTACOSANOIC ACID	C26H52O2	396					0.001		33	84	OB
26	N-HEXACOSANE	C26H54	367					~0.007		13	168	OB
								~0.006		13	168	OB
27	N-HEPTACOSANE	C27H56	381					~0.040		13	168	OB
								~0.020		13	168	OB
27	HEXACOSANOIC ACID	C27H54O2	410					0.001		33	84	OB
28	DIDECYL PHTHALATE	C28H46O4	446					~0.020		13	168	OB
28	N-OCTACOSANE	C28H58	395					~0.010		13	168	OB
								~0.005		13	168	OB
29	N-NONACOSANE	C29H60	409					~0.040		13	168	OB
								~0.025		13	168	OB

Indoor Air Quality Data Base Of Organic Compounds (Cont.)

C	COMPOUND	FORMULA	MOL. WT.	ODOR µg/m³	MEAS. CONC. (µg/m³) MIN	MAX	MEDIAN	MEAN	S.D.	REF.	TIME h	BLDG. TYPE
30	N-TRIACONTANE	C30H62	423					~0.030		13	168	OB
								~0.015		13	168	OB
30	TRIACONTANE (BRANCHED)	C30H62	423					~0.030		13	168	OB
								~0.020		13	168	OB
31	N-HENTRIACONTANE	C31H64	437					~0.140		13	168	OB
								~0.100		13	168	OB
31	HENTRIACONTANE (BRANCHED)	C31H64	437					~0.075		13	168	OB
								~0.055		13	168	OB

- Definitions :

BLDG. TYPE is the type of building investigated: A = Apartment; AU = Automobile; CB = Commercial Building; H = Hospital; MH = Mobile Home; NH = Nursing Home; OB = Office Building; R = Residence; S = School; and V = Various types of buildings.

TIME is the sampling time in hours, except: D = days and W = weeks.

- Refer to Appendix C for References.

Appendix B
Sources of Indoor Organic Compounds

C	COMPOUND	FORMULA	SUBSTANTIATED SOURCES	POSSIBLE SOURCES
1	FORMALDEHYDE	CH2O	Unvented radiant gas space heaters, upholstery fabric, latex backed fabric, plywood, particle board, paneling, new clothing, fiberglass, paper plates & cups, ceiling panels, duct liners, unvented convective kerosene space heaters, unvented range-top cast iron burner, unvented gas oven, unvented one year old oven, urea foam insulation, floor covering, wallpaper caulking compounds, jointing compound, floor varnish, adhesive, fiberboard, chipboard, linoleum, floor lacquer, calcium silicate sheet, needle felt, gypsum board, insulation sheets, tobacco smoke, auto exhaust	melamine resins, acetal resins, phenolic resins
1	METHYLENE CHLORIDE	CH2Cl2	paint removers, aerosol finishers, degreasing solvent	
1	CARBON TETRACHLORIDE	CCl4	grease cleaners, adhesives, foam insulation, inks	rodenticides, fluorocarbons 11/12
1	CHLOROFORM	CHCl3	water, adhesives, foam insulation, inks	fluorocarbon 22
1	BROMODICHLOROMETHANE	CBrCl2		
1	DIBROMOCHLOROMETHANE	CBr2Cl		
1	BROMOFORM	CHBr3		medicinals
1	TRICHLOROFLUOROMETHANE (F-11)	CCl3F	refrigerant	
2	TETRACHLOROETHYLENE	C2Cl4	dry cleaning, adhesives, foam insulation, inks	
2	1,1,1-TRICHLOROETHANE	C2H3Cl3	dry cleaning, cleaning fluid	
2	TRICHLOROETHYLENE	C2HCl3	adhesives, foam insulation, inks, photo films, tape, coatings, lubricants, rubber	solvent for paints and varnishes, dry cleaning
2	VINYLIDENE CHLORIDE	C2H2Cl2		
2	1,2-DICHLOROETHANE	C2H4Cl2	adhesives, foam insulation, tape	
2	ETHYLAMINE	C2H7N		
2	ACETIC ACID	C2H4O2	tobacco smoke	food preservative, cooking, solvent for gums, resins, volatile oils, textiles
2	ACETALDEHYDE	C2H4O	auto exhaust	perfumes, flavors, dyes, tobacco smoke

Sources of Indoor Organic Compounds (cont.)

C	COMPOUND	FORMULA	SUBSTANTIATED SOURCES	POSSIBLE SOURCES
2	ETHANOL	C2H6O	fiberboard	solvent, antifreeze, tobacco smoke
2	N-NITROSO-DIMETYLAMINE	C2H6N2O	auto interior furnishings	gasoline
3	PROPANE	C3H8	auto exhaust	fuel gas, refrigerant, tobacco smoke
3	ISOPROPANOL	C3H8O	particle board	antifreeze, solvent for gums, shellac, essential oils, cosmetics
3	ACETONE (PROPANONE)	C3H6O	lacquer solvent, auto exhaust	tobacco smoke, pharmaceuticals
3	LACTIC ACID	C3H6O3		
3	PYRUVIC ACID	C3H4O3		medicinal ointments
3	1,2-DICHLOROPROPANE	C3H6Cl2		
3	DIBROMOCHLOROPROPANE	C3H5Br2Cl		
4	ETHYLACETATE	C4H8O2	linoleum floor covering	artificial fruit essences, solvent for varnishes & lacquers, perfume, artificial leather
4	BUTANE	C4H10	fuel, tobacco smoke	
4	ISOBUTANE	C4H10	fuel	
4	DIETHYLAMINE	C4H11N		resins, dyes, pharmaceuticals, synthetic rubber
4	DIMETHYLACETAMIDE	C4H10ON		solvent for many organic reactions
4	N-BUTYLACETATE	C4H10O2	floor lacquer	
4	I-BUTYLACETATE	C4H10O2	floor lacquer	
4	1,4-DIOXANE	C4H8O2		solvent for many oils, waxes, dyes, cellulose acetate
4	N-BUTANOL	C4H10O	edge sealing molding tape, jointing compound, cement flagstone, linoleum	flavors, perfumes, industrial cleaners, paint removers
4	I-BUTANOL	C4H10O	floor covering, floor lacquer, architectural coating	tobacco smoke, plasticizers
4	BUTANAL	C4H8O		

Sources of Indoor Organic Compounds (cont.)

C	COMPOUND	FORMULA	SUBSTANTIATED SOURCES	POSSIBLE SOURCES
4	2-BUTANONE (MEK)	C4H8O	floor/wall covering, calcium silicate sheet, fiberboard, caulking compounds, particle board, tobacco smoke, architectural coating, auto exhaust, wood stain	synthetic resins, tobacco smoke
4	DICHLORVOS (DDVP)	C4H7O4Cl2P	insecticide	
4	2-ETHOXY-ETHANOL (CELLOSOLVE)	C4H10O2	epoxy paint	
4	N-NITROSOMORPHOLINE		auto interior furnishings	gasoline
5	PENTANE	C5H12	tobacco smoke	
5	I-AMYL ALCOHOL	C5H12O		solvent in organic syntheses
5	PROPYL ACETATE	C5H10O2		flavors, perfumes, plastics
5	2-METHYL BUTANE (ISOPENTANE)	C5H12		
6	N-HEXANE	C6H14	chipboard, gypsum board, insulation foam, floor covering, wallpaper, wood stain, floor wax, tobacco smoke	
6	CYCLOHEXANE	C6H12	needle felt, tobacco smoke	solvent for lacquers and resins, paint and varnish remover
6	CYCLOHEXANONE	C6H10O		solvent for many resins fats, waxes and DDT
6	2-HEXANONE (N-BUTYL KETONE)	C6H12O		
6	HEXANAL	C6H12O	auto exhaust, polyurethane, floor wax	
6	4-METHYL-2-PENTANONE	C6H12O	floor/wall covering, tobacco smoke	
6	METHYLCYCLOPENTANE	C6H12	tobacco smoke	
6	2-METHYLPENTANE (ISOHEXANE)	C6H14	chipboard, gypsum board, insulation foam, floor covering, wall paper, tobacco smoke	
6	3-METHYLPENTANE	C6H14	tobacco smoke	
6	BENZENE	C6H6	tobacco smoke, adhesives, spot cleaners, paint remover, particle board, foam insulation, inks, photo film, auto exhaust, wood stain	detergents
6	CHLOROBENZENE	C6H5Cl		solvent for paints and insecticides
6	O-DICHLOROBENZENE	C6H4Cl2	deodorizers, moth crystals	

Sources of Indoor Organic Compounds (cont.)

C	COMPOUND	FORMULA	SUBSTANTIATED SOURCES	POSSIBLE SOURCES
6	M-DICHLOROBENZENE	C6H4Cl2	deodorizers, moth crystals	
6	P-DICHLOROBENZENE	C6H4Cl2	deodorizers, moth crystals	
6	M,P-DICHLOROBENZENE	C6H4Cl2	deodorizers, moth crystals	
6	1,2,3-TRICHLOROBENZENE	C6H3Cl3		termiticide
6	1,2,4-TRICHLOROBENZENE	C6H3Cl3		
6	1,3,5-TRICHLOROBENZENE	C6H3Cl3		
6	HEXACHLOROBENZENE	C6Cl6	fungicide	
6	TETRACHLOROPHENOL	C6H2Cl4O	wood preservative	
6	GAMMA-BHC	C6H6Cl6	insecticide	
6	2-ETHOXYETHYLACETATE	C6H12O3	floor lacquer, epoxy paints	
6	PENTACHLOROPHENOL	C6HCl5O	wood preservative	
6	ALPHA-BHC	C6H6Cl6	insecticide	
6	ISO-BUTYLACETATE	C6H12O2		flavorings, solvent
6	BUTYLACETATE	C6H12O2	floor lacquer	
7	TOLUENE	C7H8	solvent-based adhesive, water-based adhesive, edge-sealing molding tape, wallpaper, jointing compound, calcium silicate sheet, needle felt, floor covering, vinyl coated wallpaper, caulking compound, paint, chipboard, linoleum floor covering, kerosene heaters, tobacco smoke, architectural coating, auto exhaust	gasoline
7	BUTYL ACRYLATE	C7H12O2		used as monomer in polymers and resins for textile and leather finishes
7	METHYLCYCLOHEXANE	C7H14		
7	HEPTANE	C7H16	floor covering, floor varnish, kerosene heaters, particle board, adhesives, floor wax, glass cleaner	
7	2-METHYLHEXANE	C7H16		
7	3-METHYLHEXANE	C7H16		
7	DIMETHYLCYCLOPENTANES	C7H14		
7	BENZALDEHYDE	C7H6O	fiberboard, particle board, auto exhaust	

Sources of Indoor Organic Compounds (cont.)

C	COMPOUND	FORMULA	SUBSTANTIATED SOURCES	POSSIBLE SOURCES
8	ETHYLBENZENE	C8H10	floor/wall covering, insulation foam, chipboard, caulking compounds, jointing compound, fiberboard, calcium silicate sheet, adhesives, floor lacquer, grease cleaners, photo film, architectural coating, polyurethane	solvents
8	STYRENE	C8H8	insulation foam, jointing compound, fiberboard, tobacco smoke, adhesives, inks, photo film, lubricants	unsaturated polyester resins
8	XYLENES	C8H10	needle felt, adhesives, jointing compound, wallpaper, caulking compounds, floor covering, floor lacquer, grease cleaners, shoe dye, tobacco smoke	gasoline
8	O-XYLENE	C8H10	needle felt, adhesives, jointing compound, wallpaper, caulking compounds, floor covering, floor lacquer, grease cleaners, shoe dye, tobacco smoke	
8	M,P-XYLENE	C8H10	needle felt, adhesives, jointing compound, wallpaper, caulking compounds, floor covering, floor lacquer, grease cleaners, shoe dye, tobacco smoke	
8	M-XYLENE	C8H10	needle felt, adhesives, jointing compound, wallpaper, caulking compounds, floor covering, floor lacquer, grease cleaners, shoe dye, tobacco smoke, kerosene heaters	
8	P-XYLENE	C8H10	needle felt, adhesives, jointing compound, wallpaper, caulking compounds, floor covering, floor lacquer, grease cleaners, shoe dye, tobacco smoke, kerosene heaters	
8	DIMETHYL BENZENE	C8H10	floor adhesive	
8	ISOOCTANE (2-METHYL-HEPTANE)	C8H18	floor covering, floor varnish, adhesives	gasoline
8	N-OCTANE	C8H18	floor covering, adhesives, floor varnish, kerosene heaters, floor wax	
8	2-BROMOOCTANE (OCTYL BROMIDE)	C8H17Br		used in organic syntheses
8	2-ETHYLHEXANOL	C8H19O		
8	RONNEL	C8H8O3Cl3PS	insecticide	

Sources of Indoor Organic Compounds (cont.)

C	COMPOUND	FORMULA	SUBSTANTIATED SOURCES	POSSIBLE SOURCES
8	2,4 - D	C8H6Cl2O3	insecticide	
8	CHLOROTHALONIL	C8Cl4N2	insecticide	
8	ATRAZINE	C8H14ClN5	insecticide	
9	NONANE	C9H20	wallpaper, caulking compounds, floor covering, chipboard, adhesives, cement flagstone, jointing compound, floor varnish, kerosene heaters, floor wax, wood stain, polyurethane	
9	2,5-DIMETHYL-HEPTANE	C9H20		
9	ETHYL TOLUENE	C9H12	floor wax	
9	TRIMETHYLCYCLOHEXANE	C9H18	floor wax	
9	O-ETHYLTOLUENE	C9H12	floor wax	
9	M,P-ETHYLTOLUENE	C9H12	floor wax	
9	M-ETHYLTOLUENE	C9H12	floor wax	
9	CUMENE	C9H12		petroleum solvents
9	QUINOLINE	C9H7N		used in dyes, solvent for resins
9	ISOQUINOLINE	C9H7N		used in synthesis of dyes and insecticides, rubber accelerator
9	INDANE (HYDRINDENE)	C9H10		coal tar
9	1,2,3 TRIMETHYLBENZENE	C9H12	floor/wall covering, floor wax	
9	1,2,4 TRIMETHYLBENZENE	C9H12	floor/wall covering, linoleum floor covering, caulking compound, vinyl coated wallpaper, needle felt, jointing compound, cement flagstone, floor varnish, chipboard, floor wax	
9	1,3,5 TRIMETHYLBENZENE	C9H12	caulking compounds, floor/wall covering, floor wax, wood stain, polyurethane	
9	N-PROPYLBENZENE	C9H12	adhesives, floor/wall covering, chipboard, needle felt, paint, caulking compounds, insulation foam, kerosene heaters	

Sources of Indoor Organic Compounds (cont.)

C	COMPOUND	FORMULA	SUBSTANTIATED SOURCES	POSSIBLE SOURCES
9	I+N-PROPYLBENZENE	C9H12	adhesives, floor/wall covering, chipboard, needle felt, paint, caulking compounds, insulation foam, kerosene heaters	
9	ISOPROPYLBENZENE	C9H12	floor/wall covering, paint, insulation foam, jointing compound, architectural coating	
9	O-METHYLETHYLBENZENE	C9H12		
9	M-METHYLETHYLBENZENE	C9H12		
9	P-METHYLETHYLBENZENE	C9H12		
9	O+P-METHYLETHYLBENZENE	C9H12	architectural coating	
9	NONANAL	C9H18O	insecticide	
9	1-NONENE	C9H18	floor wax	
9	CHLORPYRIFOS	C9H11Cl3NO3PS	insecticide	
9	CAPTAN	C9H8Cl3NO2S	insecticide	
9	FOLPET	C9H4Cl3NO2S	insecticide	
10	DECANE	C10H22	jointing compound, needle felt, chipboard, floor varnish, wallpaper, fiberboard, cement flagstone, floor/wall covering, adhesives, caulking compounds, kerosene heaters, wood stain, polyurethane, floor wax, architectural coating	
10	N-BUTYLBENZENE	C10H14		solvent
10	P-METHYLISOPROPYLBENZENE	C10H14		
10	LIMONENE	C10H16	paint, adhesives, chipboard, floor wax, ceiling cleaner	
10	PINENE	C10H16		camphor, insecticides, solvents, plasticizers, perfumes
10	a-PINENE	C10H16	cement flagstone, fiberboard, gypsum board, adhesive, insulation sheets, chipboard, calcium silicate sheet	
10	b-PINENE	C10H16		
10	a-TERPINENE	C10H16		oil of lemon
10	CAMPHENE	C10H16		essential oils
10	CAMPHOR	C10H16O	moth crystals	

Sources of Indoor Organic Compounds (cont.)

C	COMPOUND	FORMULA	SUBSTANTIATED SOURCES	POSSIBLE SOURCES
10	NAPHTHALENE (TETRALIN)	C10H12	moth crystals	
10	CHLORDANE	C10H6Cl8	insecticide	
10	MALATHION	C10H19O6PS2	insecticide	
10	DACTHAL	C10H6Cl4O4	herbicide	
10	EUCALYPTOLE (CINEOLE)	C10H18O		medicinal use
10	HEPTACHLOR	C10H5Cl7	insecticide	
10	NICOTINE	C10H14N2	tobacco smoke	
10	MALATHION	C10H17O6PS2	insecticide	
10	DACTHAL	C10H6Cl4O4	insecticide	
10	p-CYMENE	C10H14	ceiling cleaner, ceramic-floor cleaner, desk cleaner	
11	UNDECANE	C11H24	wallpaper, gypsum board, floor/wall covering, jointing compound, cement flagstone, caulking compound, chipboard, needle felt, floor varnish, paints, paint removers, architectural coating, wood stain, polyurethane, floor wax, desk cleaner, stone-floor cleaner, ceiling cleaner	
11	1-METHYLNAPHTHALENE	C11H10		
11	2-METHYLNAPHTHALENE	C11H10		
11	PROPOXUR	C11H15NO3	insecticide	
11	BENDIOCARB	C11H13NO4	insecticide	
12	DODECANE	C12H26	floor varnish, floor/wall covering, kerosene heaters, architectural coating	
12	DIAZINON	C12H21N2O3PS	insecticide	
12	ALDRIN	C12H8Cl6	insecticide	
12	ORTHO-PHENYLPHENOL	C12H10O	tobacco smoke	
12	4-PHENYLCYCLOHEXENE (4-PC)	C12H14	latex backing on carpets	
13	TRIDECANE	C13H28	kerosene heaters, architectural coating	
14	TETRADECANE	C14H30	kerosene heaters	
14	PHENANTHRENE	C14H10	unvented gas burner	
14	ANTHRACENE	C14H10	unvented gas burner	

Sources of Indoor Organic Compounds (cont.)

C	COMPOUND	FORMULA	SUBSTANTIATED SOURCES	POSSIBLE SOURCES
15	PENTADECANE	C15H32		
15	NONYLPHENOL ISOMERS	C15H24O		lubricating oil additives, resins, plasticizers,surface active agents
16	DIBUTYLPHTHALATE	C16H22O4	plastics	
16	HEXADECANE	C16H34		
16	HEXADECANE (BRANCHED)	C16H34		
16	FLUORANTHENE	C16H10	unvented gas burner, tobacco smoke	
16	PYRENE	C16H10	unvented gas burner, tobacco smoke	
16	1-NITROPYRENE	C16H9O2N		
16	3-NITROFLUORANTHENE	C16H9O2N		
18	CHRYSENE	C18H12	unvented gas burner, tobacco smoke	
18	CYCLOPENTA(C,D)PYRENE	C18H10		
18	BENZO(A)ANTHRACENE	C18H12	tobacco smoke, auto exhaust	
19	BUTYLBENZYLPHTHALATE	C19H20O4		
20	BENZOFLUORANTHENES	C20H12	unvented gas burner, vented wood-burning stove, tobacco smoke	
20	BENZO(A)PYRENE	C20H12	vented wood-burning stove, unvented gas burner, unvented coal-burning stove, tobacco smoke, auto exhaust	
20	BENZO(E)PYRENE	C20H12	cook stove, tobacco smoke	
22	DIHEPTYLPHTHALATE	C22H34O4		
22	INDENO(1,2,3-C,D)PYRENE	C22H12	vented wood-burning stove, unvented gas burner, tobacco smoke	
23	N-TRICOSANE	C23H48		
24	N-TETRACOSANE	C24H50		
24	DI(2-ETHYLHEXYL)PHTHALATE	C24H38O4		
24	TRIS(2-ETHYLHEXYL)PHOSPHATE	C24H51O4P		
24	BENZO(G,H,I)PERYLENE	C24H14	vented wood-burning stove, tobacco smoke	
24	CORONENE	C24H12		
25	N-PENTACOSANE	C25H52		
25	BIS(2-ETHYLHEXYL)AZELATE	C25H48O4		

Sources of Indoor Organic Compounds (cont.)

C	COMPOUND	FORMULA	SUBSTANTIATED SOURCES	POSSIBLE SOURCES
26	DINONYL PHTHALATE	C26H42O4		
26	N-HEXACOSANE	C26H54		
27	N-HEPTACOSANE	C27H56		
28	DIDECYL PHTHALATE	C28H46O4		
28	N-OCTACOSANE	C28H58		
29	N-NONACOSANE	C29H60		
30	N-TRIACONTANE	C30H62		
30	TRIACONTANE (BRANCHED)	C30H62		
31	N-HENTRIACONTANE	C31H64		
31	HENTRIACONTANE (BRANCHED)	C31H64		

Appendix C

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