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VAPOR PRESSURES OF ORGANIC COMPOUNDS IN THE RANGE BELOW ONE MILLIMETER OF MERCURY

U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS

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OCTOBER 1960

VAPOR PRESSURES OF ORGANIC COMPOUNDS IN THE RANGE BELOW ONE MILLIMETER OF MERCURY

E. E. Hughes and S. G. Lias

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Vapor Pressures of Organic Compounds in the Range Below One Millimeter of Mercury.

By

E. E. Hughes and S. G. Lias

Data for vapor pressures less than one millimeter of mercury for over three hundred organic compounds have been collected. The values are presented in tabular form. No attempt has been made to evaluate the reliability of these data except where several investigators have studied the same compound over the same pressure range. A brief discussion of the methods and instruments which have been used to measure low vapor pressures is included.

1. Introduction

Comparatively few determinations of the saturation vapor pressures of pure organic compounds have been made in the pressure region below one millimeter of mercury. Vapor pressures greater than this have been thoroughly studied and available data have been rather completely tabulated [87,101]. No such comprehensive collection of the data has been made for compounds with lower vapor pressures, probably because of the lack of data and because of the difficulty of assessing the reliability of the few methods suitable for measuring these low pressures. The following table is a collection of available published data. No attempt has been made to evaluate the reliability of these data, except in the few cases where several investigators have studied the same compound over the same pressure range.

A brief discussion of the methods and instruments which have been used to measure low vapor pressures precedes the table. The remarks on methods and recent developments supplement the review of Ditchburn and Gilmour [34].

2. Methods and Instruments

2.1 Gas Saturation. - This method depends on measuring the quantity of a volatile substance necessary to saturate a fixed volume of an indifferent gas. Usually the substance whose vapor pressure is to be determined is contained in a saturator held at a fixed temperature. An inert carrier gas is passed through the saturator and the amount of material removed from the saturator is determined. The partial pressure of the substance, and consequently, its saturation pressure at the particular temperature, can then be easily calculated.

The method is simple and has been used frequently for determining low pressures [11,13]. There are, however, many sources of error and great care in the design and use of the apparatus is essential. It is one of the few methods that can be used at low temperatures.

2.2 Mass Spectrometry. - Tickner and Lossing [104,105] have used the mass spectrometer to measure vapor pressures of a number of compounds at low temperatures. The instrument is empirically calibrated for each compound. A saturator containing the substance at a fixed temperature is connected to the instrument and the concentration of the substance in the vapor space over the liquid is determined.

The major advantage of this method is that the presence of impurities can be easily recognized. Their effect can often be minimized by selection of a mass number characteristic only of the substance being investigated. Other instrumental methods, such as non-dispersive infrared spectrophotometry and gas chromatography, may be used in a similar way to measure the vapor concentration, provided their sensitivity for the substance is sufficiently high.

2.3 Effusion and Evaporation. - Knudsen [54-57] showed that under certain circumstances the rate at which a substance effuses through an orifice is a function of the temperature, its molecular weight, and the pressure drop across the orifice. Methods, based on some modification of Knudsen's method, have been the primary methods for determining the low vapor pressures of many organic and most of the inorganic compounds. These methods are simple, and the amounts of material and time required are generally small.

The effusion method depends rather critically on certain dimensional factors and, because of this, it has not been used at temperatures much below room temperature. One requirement is that the orifice have a diameter less than one-tenth of the mean free path of the molecules of the substance. At high temperatures and low pressures, diameters as large as a half centimeter have been used, but at low temperatures the orifice must be considerably smaller. Small orifices are in reality short tubes as compared with orifices of larger diameter, and the simple laws of effusion through orifices no longer apply [88,109]. Clausing [27,28] determined theoretically the effect of varying the ratio of the length of tube to its diameter, but no thorough experimental study of the validity of the "Clausing factors" has been published.

The Knudsen method depends ultimately on determining the mass flow of the substance through the orifice. In the simplest methods, the substance is contained in a small crucible which is covered with a lid pierced with an orifice of known diameter. The mass of material lost from the crucible during a measured time interval is determined by weighing the crucible or by collecting the effused material. The weight loss can be conveniently followed by suspending the crucible from a microbalance [16,17,76,106]. Instead of measuring the mass effusing, it is possible to measure the force exerted by the effusing vapor. The effusion cell can be calibrated with a substance of known vapor pressure and the vapor pressure of the unknown can be calculated from the reaction force [9,69].

A recent technique for determining the vapor pressure of inorganic substances depends on the "counting" of radioactive isotopes in the vapor effusing from a Knudsen cell. This has been used only for inorganic substances [67].

Langmuir [59] has proposed a modification of the Knudsen method which can be used to determine very small vapor pressures. The vapor pressure can be calculated from the rate of evaporation from a surface of known area. This modification is more easily applied to metals and other substances having very small vapor pressures, than to organic compounds.

2.4 Thermal Conductivity. - Delaplace [33] measured the thermal conductivity of the vapor phase of a saturated system and related this to the concentration of the substance. He reported pressures as low as one micron. His values agree fairly well with those of other investigators who have studied the same compounds over the same temperature interval [15,105].

2.5 Boiling Point Methods. - Several methods are available in which the boiling points of substances are measured at low pressures [43,45]. An inert and noncondensible gas is contained in the system at low pressure. The evolution of vapor from the liquid being studied increases abruptly when the vapor pressure equals the pressure of the residual gas. The method is accurate, but its use has been limited by difficulties encountered in the design of suitable apparatus and in the measurement of temperature.

2.6 Mechanical Methods. - McLeod gages and oil manometers are generally unsuitable for measuring condensible gases at low pressure, although several excellent determinations of vapor pressure have been reported [10,15]. Oil manometers have limited use because of the significant vapor pressures of the manometric fluids and the solubility of many substances in these oils. Several modifications have been reported [11,44,62], but in general they can be used only at higher pressures.

These methods are particularly sensitive to errors caused by the difference in temperature between the sample and the measuring instrument. The errors are often quite large and must be carefully evaluated. A theoretical treatment of this effect, which may also affect other methods, is presented by Liang [60,61].

The Rodebush manometer measures the force required to lift a "lid" which is subjected to the vapor pressure of a substance on one side and to a high vacuum on the other [8,85,86].

Tube gages that operate like Bourdon tubes have been used for measuring very low pressures [49]. The deflection of the tubes, usually of quartz, is quite small and is measured with a microscope.

2.7 Dew Point Methods. - The temperature at which a substance just begins to condense can be used to calculate its concentration in the vapor phase. If its partial pressure in the vapor phase is known, a determination of the "dew point" can be used to determine directly the temperature at which the particular pressure corresponds to the vapor pressure. Several applications of this method have been reported [51,112], but the accuracy of the method is doubtful.

2.8 Measurement of Ion Currents. - Methods that depend on the measurement of ion currents have long been used for measuring low pressures. The methods require an empirical calibration for each substance and this restriction limits their use in determining vapor pressures [42].

2.9 Viscous Damping. - The rate of damping of a vibrating quartz fiber can be related to the pressure of a gas in the system containing the fiber [28,58]. Several applications of this method have been reported [1-7,25].

3. Table

3.1 Treatment of Data. - The saturation temperatures given in the table were obtained either by direct calculation from logarithmic equations or by graphical interpolation of the data presented by the original worker. The temperature range specified for a compound is approximately the experimental range reported by the investigators. In most cases, sufficient data were available to allow the calculation of at least three points without exceeding the experimental pressure range by more than a half order of magnitude. In a few cases, data were reported at only one temperature. These have been included in the table with appropriate notation.

The state, solid, or liquid, for which the data were collected is indicated by the notation following the compound name. Melting points are given only when the tabulated data pass through this point.

No attempt has been made to evaluate the methods, except in those cases where the data of several investigators concerning a single compound have disagreed. The final value selected was an average based on the expected reliability of the several methods and the general care taken in selecting materials and in reporting data. The number of significant figures was chosen for uniformity and does not reflect the precision of the original measurements.

Original references were always consulted when available. In some instances, it was necessary to rely on information obtained from abstracts or from other sources. For some compounds, data of a particular investigator are not included in the table, but the work is listed among the references because of its interest.

3.2 Listing of Compounds. - Compounds are listed by empirical formula. The order is determined first by the number of carbon atoms, secondly, by the number of hydrogen atoms, and finally, by the symbols of the remaining elements taken in alphabetical order. The names of compounds are those recommended by the International Union of Pure and Applied Chemistry (76a), except where the common name is preferable.

4. Acknowledgment

This work was supported by the Public Health Service of the Department of Health, Education, and Welfare.

Temperature of Saturated Vapor at Pressures Between 0.01 and 1000 Microns of Mercury

Formula	Name	Temperature in Degrees Centigrade at Indicated Pressures in Microns [1]											Method [2]	References
		0.01μ	0.05μ	0.1μ	0.5μ	1.0μ	5.0μ	10.0μ	50.0μ	100.0μ	500.0μ	1000μ		
CCl_4	Carbon tetrachloride (S) [3]	-	-	-	-	-	-	-	-	-72.2	-56.7	-49.3	e	(70)
CH_3BrHg	Methyl mercury bromide (S)	-	-	-	-7.2	-1.0	+14.4	-	-	-	-	-	k	(25)
CH_3ClHg	Methyl mercury chloride (S)	-	-	-	-8.3	-1.9	+14.2	-	-	-	-	-	k	(25)
CH_3HgI	Methyl mercury iodide (S)	-	-	-	-7.9	-1.5	+14.6	-	-	-	-	-	k	(25)
CH_4	Methane (S)	-	-	-	-	-225.0	-221.6	-220.1	-215.8	-213.8	-208.5	-206.0	b	(105)
CH_4N_2O	Urea (S)	-	-	-	-	67.5	86.2	94.9	-	-	-	-	c	(102)
C_2Cl_6	Hexachloroethane (S)	-	-	-	-	-	-	-	-	9.4	28.8	38.0	i	(49)
C_2H_2	Acetylene (S)	-	-	-184.2	-179.8	-176.7	-170.7	-167.9	-160.8	-157.4	-148.6	-144.5	bdg	(15,33,105)
$C_2H_2AsCl_3$	2-Chloroethenyldichloro-arsine (Lewisite)(L)	-	-	-	-	-	-	-	-	+ 1.2	22.6	32.9	g	(10)
$C_2H_2O_4$	Oxalic acid (α) (S)	-	-	-	38.3	44.1	58.4	-	-	-	-	-	c	(21)
$C_2H_2O_4$	Oxalic acid (β) (S)	-	-	-	34.0	39.9	54.4	-	-	-	-	-	c	(21)
$C_2H_3NO_3$	Oxamic acid (S)	-	-	67.0	81.9	88.8	-	-	-	-	-	-	c	(19)
C_2H_4	Ethane (S)	-	-201.0	-199.1	-195.4	-193.5	-188.8	-186.4	-180.8	-178.0	-170.7	-	bdg	(33,61,63,105)
$C_2H_4Br_2$	Dibromoethane (S)	-	-	-	-	-	-	-	-38.6	-32.6	-17.2	-9.5	e	(70)
$C_2H_4N_2O_2$	1,2-Diformyl hydrazine (S)	-	-	-	-	89.1	107.4	115.9	137.1	-	-	-	c	(102)
$C_2H_4N_2O_2$	Ethanediamide (S)	-	-	88.0	103.9	111.2	-	-	-	-	-	-	c	(19)
$C_2H_4N_2S_2$	Dithio oxamide (L)	-	-	-	-	77.8	94.2	101.7	-	-	-	-	c	(19)

[1] In all cases the temperature has been given to a tenth of a degree. This does not reflect the quality of the original work, but is only chosen for uniformity.

[2] Methods

a. Gas saturation
b. Mass Spectrometry
c. Effusion and evaporation
d. Thermal conductivity
e. Boiling point methods
f. Rodebush manometer
g. Manometric and modified McLeod gages
h. Dew point methods
i. "Bourdon" gage
j. Ionization gage
k. Viscosity gage
x. Method unknown

[3] The physical state is indicated by letter, (S) solid, (L) liquid, except where a transition occurs. In these case the transition temperature is indicated.

Formula	Name	Temperature in Degrees Centigrade at Indicated Pressures in Microns											Method	References
		0.01μ	0.05μ	0.1μ	0.5μ	1.0μ	5.0μ	10.0μ	50.0μ	100.0μ	500.0μ	1000μ		
C_2H_5BrHg	Ethyl mercury bromide (S)	-	-	-	17.3	23.8	40.0	-	-	-	-	-	k	(25)
C_2H_5ClHg	Ethyl mercury chloride (S)	-	-	-	15.7	22.2	38.3	-	-	-	-	-	k	(25)
C_2H_5HgI	Ethyl mercury iodide (S)	-	-	-	15.0	21.2	36.5	-	-	-	-		k	(25)
C_2H_5NO	Acetamide (S)	-	-	-	-	-	-	+1.3	20.2	29.2	-	-	k	(1)
C_2H_6	Ethane (-172)	-	-	-	-	-188.8	-181.2	-178.4	-172.0	-169.3	-162.6	-159.6	bd	(33,105)
C_3H_6	Cyclopropane (S)	-	-	-	-	-157.7	-155.1	-148.0	-140.0	-136.2	-126.8	-	b	(105)
C_3H_6	Propene (L)	-	-	-	-	-169.9	-163.1	-159.6	-151.2	-147.3	-136.7	-131.4	bd	(33,105)
C_3H_7NO	N-Methyl acetamide (S)	-	-	-	-	-	-	- 10.3	8.0	16.7	-	-	k	(1)
C_3H_8	Propane (L)	-	-	-	-	-167.8	-160.7	-157.4	-148.8	-144.8	-134.0	-128.8	b	(104,105)
$C_3H_8O_3$	Glycerol (L)	-	-	-	-	-	53.6	86.8	197.7	-	-	-	c	(113)
$C_4H_2O_3$	Maleic anhydride (S)	-	-	25.1	37.6	43.4	-	-	-	-	-	-	g	(111)
$C_4H_6ClFO_2$	2-Chloroethyl fluoroacetate (L)	-	-	-	-	-	-	-	-	6.0	25.8	35.2	a	(84)
$C_4H_6F_2O_2$	2-Fluoroethyl fluoroacetate (L)	-	-	-	-	-	-	-	-	-4.7	+14.0	22.9	a	(84)
C_4H_8	1-Butene (-130)	-	-	-	-	-147.3	-139.1	-135.4	-125.6	-120.8	-108.8	-103.3	bd	(33,105)
C_4H_8	2-Methyl propene (S)	-	-	-	-	-154.4	-146.3	-142.4	-132.7	-128.0	-	-	d	(33)
$C_4H_8Cl_2S$	Bis-(2-Chloroethyl)sulfide (L)	-	-	-	-	-	-	-	16.0	24.0	45.4	55.4	ag	(11,13,80)
$C_4H_8Cl_2S_3$	Bis-(2-Chloroethyl)trisulfide(L)	-	-	-	-	18.4	36.1	44.3	65.4	-	-	-	a	(80)
$C_4H_8F_2O_4S$	Bis-(2-Fluoroethyl)sulfate (L)	-	-	-	-	-	+2.2	9.2	27.0	35.4	56.6	66.8	a	(84)
$C_4H_9ClFO_3P$	2-Chloroethyl ethyl fluorophosphate (L)	-	-	-	-	-	-	+0.6	18.4	26.9	48.5	58.8	a	(84)
C_4H_{10}	n-Butane (-135)	-	-	-	-	-145.5	-137.3	-133.2	-123.2	-118.4	-106.2	-100.3	bd	(33,105)
C_4H_{10}	2-Methyl propane (L)	-	-	-	-	-	-143.8	-139.9	-130.2	-125.8	-113.9	-108.4	bd	(33,105)
$C_4H_{10}FO_2P$	Fluoroisopropoxymethyl phosphine oxide (L)	-	-	-	-	-	-	-	-	-11.6	+6.3	14.8	a	(84)
$C_4H_{10}FO_3P$	Diethyl fluorophosphate (L)	-	-	-	-	-	-	-	-	-9.2	+11.0	20.7	a	(84)
$C_4H_{12}FN_2OP$	Tetramethyl diamidophosphoryl fluoride (L)	-	-	-	-	-	-	-	-1.4	+7.3	29.8	40.6	a	(84)

Formula	Name	Temperature in Degrees Centigrade at Indicated Pressures in Microns											Method	References
		0.01μ	0.05μ	0.1μ	0.5μ	1.0μ	5.0μ	10.0μ	50.0μ	100.0μ	500.0μ	1000μ		
$C_5H_4O_2S$	Thiophene-2-carboxylic acid (S)	-	-	-	-	33.2	46.8	53.0	-	-	-	-	c	(18)
$C_5H_4O_3$	Furan-2-carboxylic acid (S)	-	-	-	-	-	43.1	48.5	61.8	-	-	-	c	(18)
$C_5H_5NO_2$	Pyrrole-2-carboxylic acid(S)	-	-	-	-	65.3	75.8	83.5	-	-	-	-	c	(18)
$C_5H_6O_2$	2-pentyne-1-ol-4-one (L)	-	-	-	-	-	-	+3.1	19.9	27.8	47.9	57.4	a	(82)
$C_5H_7AsCl_2$	Methyl-bis-(2-chloroethenyl)arsine (L)	-	-	-	-	-	-	-	-	15.0	36.5	46.7	a	(83)
$C_5H_8ClFO_2$	Methyl-2-chloro-4-fluoro butanoate(L)	-	-	-	-	-	-	-	-	-1.2	+18.2	27.5	a	(84)
$C_5H_8F_2O_3$	Bis-(2-Fluoroethyl)carbonate (L)	-	-	-	-	-	-	-3.4	+13.5	21.4	41.5	51.1	a	(84)
$C_5H_8N_4O_{12}$	Pentaerythritol tetranitrate(S)	-	-	-	95.3	100.7	113.7	119.6	134.1	-	-	-	c	(36)
C_5H_9ClS	Propen-2-chloroethyl sulfide(L)	-	-	-	-	-	-	-	-	-8.1	+12.1	21.8	a	(80)
$C_5H_9FO_2S$	Methyl-4-fluorothiol butanoate(L)	-	-	-	-	-	-	-	-	-5.9	+13.7	23.1	a	(84)
$C_5H_9FO_3$	Methyl-2-hydroxy-4-fluoro butanoate(L)	-	-	-	-	-	-	-4.5	+12.0	19.7	39.4	48.7	a	(84)
C_5H_9NO	2-Piperidone (S)	-	-	-	-	11.0	26.3	33.4	-	-	-	-	k	(3)
$C_5H_{10}N_2O_2$	2-Acetamide N-methyl acetamide(S)	-	-	-	75.1	82.4	100.6	-	-	-	-	-	k	(6)
$C_5H_{11}AsBr_2$	Dibromo-n-pentyl arsine (L)	-	-	-	-	-	-	-	29.1	38.2	61.4	-	a	(83)
C_5H_{12}	n-Pentane (L)	-	-	-	-	-125.7	-116.4	-112.0	-101.0	-95.8	-81.7	-75.0	b	(105)
$C_5H_{12}FO_2P$	Ethyl fluoroisopropoxy phosphine oxide (L)	-	-	-	-	-	-	-	-	-7.8	+11.3	20.4	a	(84)
$C_5H_{12}O_4$	Pentaerythritol (S)	-	-	100.1	113.5	119.5	134.4	142.0	-	-	-	-	c	(21,75)
C_6Cl_6	Hexachlorobenzene (S)	-	-	-	-	-	-	-	104.3	113.5	136.6	-	f	(91)
$C_6H_2ClN_3O_6$	1,3,5-Trinitro-2-chlorobenzene(83)	-	-	68.9_s	82.4_s	88.6	-	-	-	-	-	-	x	(74)
$C_6H_3Cl_3$	1,2,3-Trichlorobenzene (S)	-	-	-	-	-	-	-	-	21.8	40.6	49.5	f	(92)
$C_6H_3Cl_3$	1,2,4-Trichlorobenzene (17)	-	-	-	-	-	-	-	$+3.9_s$	11.2_s	34.0	-	f	(92)
$C_6H_3Cl_3$	1,3,5-Trichlorobenzene (S)	-	-	-	-	-	-	-	+9.0	17.3	38.7	-	f	(92)
$C_6H_3N_3O_6$	1,3,5-Trinitrobenzene (S)	-	-	-	-	-	86.1	93.9	113.4	-	-	-	x	(74)

Formula	Name	Temperature in Degrees Centigrade at Indicated Pressures in Microns											Method	References
		0.01μ	0.05μ	0.1μ	0.5μ	1.0μ	5.0μ	10.0μ	50.0μ	100.0μ	500.0μ	1000μ		
$C_6H_4BrNO_2$	p-Bromonitrobenzene (S)	-	-	-	-	10.4	25.0	49.8	-	-	-	-	c	(103)
$C_6H_4Br_2$	p-Dibromobenzene (S)	-	-	-30.7	-16.7	-10.2	+6.3	14.0	33.8	-	-	-	c	(115)
$C_6H_4ClNO_2$	p-Chloronitrobenzene(S)	-	-	-	-	-0.5	+12.1	17.7	32.2	-	-	-	c	(103)
$C_6H_4Cl_2$	p-Dichlorobenzene(S)	-	-	-	-	-	-	-	-	+1.8	17.4	24.7	c	(115)
$C_6H_4Cl_2O_3$	α,β-Dichloro-γ-hydroxy-γ-ethenoxy crotonic acid, γ lactone (L)	-	-	-	-	-	-	9.2	27.0	35.3	56.6	-	a	(82)
$C_6H_4N_2O_5$	2,3-Dinitrophenol (S)	-	33.1	38.7	52.4	58.7	-	-	-	-	-	-	c	(48)
$C_6H_4N_2O_5$	2,4-Dinitrophenol (S)	-	26.3	31.3	43.7	49.3	-	-	-	-	-	-	c	(48)
$C_6H_4N_2O_5$	2,5-Dinitrophenol (S)	6.2	17.9	23.2	36.4	42.4	57.4	-	-	-	-	-	c	(48)
$C_6H_4N_2O_5$	2,6-Dinitrophenol (S)	-	24.5	29.2	40.5	45.6	58.2	-	-	-	-	-	c	(48)
$C_6H_4N_2O_5$	3,4-Dinitrophenol (S)	61.9	74.5	80.3	94.4	100.8	-	-	-	-	-	-	c	(48)
$C_6H_5AsCl_2$	Phenyl dichloroarsine (L)	-	-	-	-	-	-	13.3	32.3	41.4	64.4	75.2	fa	(8,83)
C_6H_5Br	Bromobenzene (L)	-	-	-	-	-	-	-	-	-29.7	-6.8	+4.5	c	(115)
C_6H_5Cl	Chlorobenzene (L)	-	-	-	-	-	-	-	-	-45.2	-24.3	-14.3	c	(115)
C_6H_5I	Iodobenzene (L)	-	-	-	-	-	-	-	-12.0	-1.7	+25.4	38.8	c	(115)
$C_6H_5NO_2$	Nitrobenzene (L)	-	-	-	-	-	-	-	-	10.0	32.0	-	c	(98)
$C_6H_5NO_3$	o-Nitrophenol (S)	-	-	-	-	-	-	7.0	19.9	25.9	-	-	c	(98)
$C_6H_5NO_4$	2-Nitroresorcinol (S)	-	-19.7	-14.6	-2.0	+3.8	18.3	-	-	-	-	-	c	(48)
C_6H_6ClN	p-Chloroaniline(S)	-	-	-	-	+3.2	11.6	16.5	30.3	37.1	-	-	c	(103)
$C_6H_6Cl_6$	α-Hexachlorocyclohexane (S)	-	-	-	44.8	51.2	67.2	-	-	-	-	-	c	(9)
$C_6H_6Cl_6$	β-Hexachlorocyclohexane (S)	-	-	-	83.0	90.3	108.3	-	-	-	-	-	c	(9)
$C_6H_6Cl_6$	γ-Hexachlorocyclohexane (S)	-	-	-	-	52.0	64.7	70.5	84.8	91.4	-	-	c	(9)
$C_6H_6Cl_6$	δ-Hexachlorocyclohexane (S)	-	-	-	46.9	53.0	68.3	-	-	-	-	-	c	(9)

Formula	Name	Temperature in Degrees Centigrade at Indicated Pressures in Microns											Method	References
		0.01μ	0.05μ	0.1μ	0.5μ	1.0μ	5.0μ	10.0μ	50.0μ	100.0μ	500.0μ	1000μ		
$C_6H_6N_2O_2$	o-Nitroaniline (S)	-	6.6	11.7	24.3	30.1	44.4	51.0	-	-	-	-	c	(48)
$C_6H_6N_2O_2$	p-Nitroaniline (S)	32.2	44.0	49.4	62.7	68.7	83.7	90.5	-	-	-	-	c	(48,65)
C_6H_6O	Phenol (S)	-	-	-	-	-	-	-8.9	+5.6	12.4	29.3	37.3	cef	(8,72,98)
$C_6H_6O_4$	Dimethyl butynedioate (L)	-	-	-	-	-	-	-	6.7	14.9	36.2	46.3	a	(82)
C_6H_7N	α-Picoline (L)	-	-	-	-	-	-	-58.5	-45.0	-38.3	-20.5	-	f	(47)
C_6H_7N	β-Picoline (S)	-	-	-	-	-	-	-43.2	-31.2	-25.7	-11.8	-	f	(47)
C_6H_7N	γ-Picoline (S)	-	-	-	-	-	-60.6	-56.4	-45.9	-41.0	-29.0	-	f	(47)
$C_6H_{10}ClFO_2$	2-Chloroethyl-4-fluoro butanoate (L)	-	-	-	-	-	-	-3.4	+13.7	21.8	31.6	52.3	a	(84)
$C_6H_{10}F_2O_2$	2-Fluoroethyl-4-fluoro-butanoate (L)	-	-	-	-	-	-	-	-	+5.0	25.3	34.9	a	(84)
$C_6H_{10}O$	Cyclohexanone (L)	-	-	-	-	-	-	-	-31.7	-24.2	-4.9	+4.4	c	(71)
$C_6H_{10}O_6$	Dimethyl tartrate d (51.6)	-	-	-	-	-	39.2_s	44.0_s	58.8	67.3	88.8	-	c	(30)
$C_6H_{10}O_6$	Dimethyl tartrate dl (S)	-	-	-	-	37.5	49.2	54.6	67.8	73.7	88.5	-	c	(30)
$C_6H_{11}NO$	ε-Caprolactam (S)	-	-	-	-	19.3	33.8	40.4	-	-	-	-	k	(4,48)
$C_6H_{12}AsN$	Cyanoethyl-n-propyl arsine (L)	-	-	-	-	-	-	-	-	14.5	36.4	46.8	a	(83)
$C_6H_{12}ClNO$	4-(2-Chloroethyl) morpholine (L)	-	-	-	-	-	-	-	+1.6	9.9	31.4	41.7	a	(81)
$C_6H_{12}Cl_3N$	Tris-(2-Chloroethyl)amine (L)	-	-	-	-	+0.1	16.4	24.0	43.4	52.6	-	-	a	(81)
$C_6H_{12}O$	Cyclohexanol (S)	-	-	-	-	-	-	-	-4.4	+2.6	20.4	-	c	(71)
$C_6H_{12}O_2$	cis-Cyclohexane-1,2-diol (S)	-	-	-	-	-	-	-	12.1	23.4	53.5	-	c	(114)
$C_6H_{12}O_2$	trans-Cyclohexane-1,2-diol (S)	-	-	-	-	-	-	-	9.2	21.2	51.2	-	c	(114)
$C_6H_{12}O_3$	1,2-Propanediol-3-propenoxy (L)	-	-	-	-	-	-	-	46.4	54.2	74.6	84.5	x	(31)
$C_6H_{13}Cl_2N$	Ethyl-bis-(2-Chloroethyl)amine (L)	-	-	-	-	-	-	-	+4.8	13.1	34.6	44.9	a	(81)
$C_6H_{14}FO_3P$	Di-isopropyl fluorophosphate (L)	-	-	-	-	-	-	-	-	-2.6	+18.0	27.9	a	(84)
$C_6H_{14}O_4$	Triethylene glycol (L)	-	-	-	13.5	21.5	42.0	-	-	-	-	-	h	(112)

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		0.01μ	0.05μ	0.1μ	0.5μ	1.0μ	5.0μ	10.0μ	50.0μ	100.0μ	500.0μ	1000μ		
$C_7H_5Cl_2N$	N-(Dichloromethyl)aniline (L)	-	-	-	-	-	-	-	-	11.5	33.1	43.4	a	(82)
$C_7H_5F_3$	Trifluorotoluene (S)	-	-	-	-	-	-	-	-53.3	-48.0	-34.9	-	f	(90)
$C_7H_5N_3O_6$	2,4,6-Trinitrotoluene (TNT) (79.2)	-	-	-	58.3_s	63.8_s	77.1_s	83.8	103.2	112.5	136.6	148.6	acg	(35,66,74)
$C_7H_5N_3O_7$	2,4,6-Trinitroanisole (68.4)	-	-	-	63.4_s	$68.4_{s,l}$	86.3	94.5	-	-	-	-	x	(74)
$C_7H_6N_2O_5$	3,5-Dinitro-o-cresol (S)	-	19.7	24.5	36.5	41.9	55.3	-	-	-	-	-	c	(9)
C_7H_8	Toluene (L)	-	-	-	-	-	-78.9	-73.6	-59.5	-52.9	-35.6	-27.5	a	(12)
$C_7H_{12}Cl_2S$	2-Chlorocyclopentyl-2-chloroethyl sulfide (L)	-	-	-	-	-	-	20.5	39.1	47.9	70.3	-	a	(80)
$C_7H_{13}F_3O_3$	Tris-(2-Fluoroethyl)orthoformate (L)	-	-	-	-	-	+4.4	12.0	31.5	40.7	64.5	-	a	(84)
$C_7H_{15}Cl_2N$	Methyl-bis-(2-Chloropropyl)amine (L)	-	-	-	-	-	-	-	+3.6	11.9	33.4	43.6	a	(81)
$C_7H_{15}Cl_2N$	n-Propyl-bis-(2-Chloroethyl)amine (L)	-	-	-	-	-	-	-4.0	+14.3	22.9	45.1	55.7	a	(81)
$C_8H_4O_3$	Phthalic anhydride (S)	-	-	-	-	30.6	45.2	51.9	68.7	76.4	95.9	105.0	g	(29)
C_8H_6BrN	Bromotolunitrile (L)	-	-	-	-	-4.0	+11.8	19.1	37.8	46.6	69.0	-	f	(8)
$C_8H_6ClNO_3$	meta-Nitrochloroacetophenone (S)	25.6	36.9	42.1	54.8	60.6	74.8	-	-	-	-	-	c	(9)
$C_8H_6ClNO_3$	ortho-Nitrochloroacetophenone (S)	-	-	23.6	35.4	40.1	54.1	60.2	-	-	-	-	c	(9)
$C_8H_6N_2O_2$	4-Amino phthalimide (S)	-	-	-	-	-	-	171.1	191.5	200.9	224.2	-	f	(53)
$C_8H_6O_3$	Piperonal (S)	-	-	-	-	12.0	24.6	30.3	31.8	-	-	-	c	(94)
C_8H_7ClO	Chloroacetophenone (S)	-	-	-	-	9.3	21.6	27.2	41.2	47.6	63.5	-	c	(9)
C_8H_7FO	ω-Fluoroacetophenone (L)	-	-	-	-	-	-	+2.2	19.6	27.8	48.7	58.7	a	(84)
C_8H_7N	Indole (S)	-	-	-	-	+2.5	16.8	23.4	40.0	47.7	-	-	kc	(7,95)
$C_8H_7N_3O_7$	Trinitroethoxybenzene (S)	-	-	-	-	-	-	67.8	83.5	90.8	-	-	x	(74)
C_8H_8O	Phenylacetaldehyde (L)	-	-	-	-	-	-	-	-	+7.6	28.4	38.3	c	(96)
$C_8H_8O_2$	Anisaldehyde (L)	-	-	-	-	-	-	12.0	31.2	40.4	63.8	-	c	(97)
$C_8H_8O_3$	3-Methoxy-4-hydroxy benzaldehyde (Vanillin) (S)	-	-	18.7	32.1	38.3	53.7	60.8	-	-	-	-	c	(94)

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		0.01μ	0.05μ	0.1μ	0.5μ	1.0μ	5.0μ	10.0μ	50.0μ	100.0μ	500.0μ	1000μ		
C_8H_9NO	Acetanilide (S)	-	-	22.3	37.5	44.6	-	-	-	-	-	-	k	(5)
C_8H_9NO	N-Methylbenzamide (S)	-	-	14.0	29.5	36.7	-	-	-	-	-	-	k	(5)
$C_8H_9NO_2$	Methyl anthranilate (24.8)	-	-	-	-	-	13.3_s	19.5_s	37.7	46.9	70.6	81.9	c	(96)
C_8H_{10}	p-Xylene (S)	-	-	-	-	-	-	-	-	-18.7	-6.7	-1.3	g	(62)
$C_8H_{10}N_2O_2$	N,N-Dimethyl-p-nitro aniline (S)	-	-	-	-	68.8	85.4	93.1	-	-	-	-	c	(65)
$C_8H_{10}O$	Phenethanol (L)	-	-	-	-	-	-	+7.9	24.3	31.9	51.3	60.4	c	(95)
$C_8H_{14}Cl_2S$	2-Chlorocyclohexyl-2-chloroethyl sulfide(L)	-	-	-	-	-	22.4	30.7	51.8	61.9	-	-	a	(80)
$C_8H_{14}N_2O_2$	1-Acetyl-N-methyl-2-pyrrolidinecarboxamide (45.4)		-	-	-	36.7_s	58.1	68.8	-	-	-	-	k	(6)
$C_8H_{16}O_2$	Octanoic acid (L)	-	-	-	-	-	27.0	32.5	49.5	57.5	-	-	e	(100)
$C_8H_{17}Cl_2N$	n-Butyl-bis-(2-chloroethyl)amine (L)	-	-	-	-	-	-	7.7	26.3	35.0	57.5	-	a	(81)
$C_8H_{17}Cl_2N$	s-Butyl-bis-(2-chloroethyl)amine (L)	-	-	-	-	-	-	5.0	23.9	32.6	55.2	-	a	(81)
$C_8H_{17}Cl_2N$	t-Butyl-bis-(2-chloroethyl)amine (L)	-	-	-	-	-	-	+0.8	19.2	27.8	64.2	-	a	(81)
$C_8H_{17}Cl_2N$	isobutyl-bis-(2-chloroethyl)amine (L)	-	-	-	-	-	-	+2.8	20.8	29.3	51.0	61.4	a	(81)
$C_8H_{18}FO_3P$	Di-s-butyl fluorophosphate(L)	-	-	-	-	-	-	-4.8	+12.4	20.4	41.1	50.9	a	(84)
$C_9H_6O_2$	Coumarin (S)	-	-	-	19.5	25.4	39.9	46.6	-	-	-	-	c	(94)
$C_9H_{10}O$	Cinnamic alcohol (36.5)	-	-	-	-	19.2_s	30.1_s	35.0_s	51.2	59.0	-	-	c	(95)
$C_9H_{10}O_2$	p-Methoxy acetophenone (40.2)	-	-	-	-	11.0_s	23.0_s	28.5_s	42.8	51.2	74.4	85.2	c	(96)
$C_9H_{10}O_2$	Benzyl acetate (L)	-	-	-	-	-	-	-	14.6	22.7	43.5	53.3	c	(95)
$C_9H_{10}O_2$	m-Tolyl acetate (L)	-	-	-	-	-	-	-	+13.5	21.5	42.0	51.7	c	(9)
$C_9H_{10}O_3$	3-Ethoxy-4-hydroxy benzaldehyde (Bourbonal) (S)	-	-	21.9	33.8	39.2	52.7	58.8	-	-	-	-	c	(94)

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		0.01μ	0.05μ	0.1μ	0.5μ	1.0μ	5.0μ	10.0μ	50.0μ	100.0μ	500.0μ	1000μ		
$C_9H_{11}ClS$	Benzyl-2-chloroethyl sulfide (L)	-	-	-	-	-	6.4	18.3	38.2	53.2	-	-	a	(80)
C_9H_{12}	1,2,3-Trimethyl benzene (L)	-	-	-	-	-	-	-	-	-12.3	+11.1	22.5	f	(46)
C_9H_{12}	1,2,4-Trimethyl benzene (L)	-	-	-	-	-	-	-	-	-15.4	+5.2	15.1	f	(46)
C_9H_{12}	1,3,5-Trimethyl benzene (L)	-	-	-	-	-	-	-	-	-16.5	+2.0	10.8	f	(46)
$C_9H_{14}O_2$	Methyl-2-octynoate (L)	-	-	-	-	-	-	-	16.7	24.4	43.9	-	c	(97)
$C_{10}H_7NO_2$	1-Nitro naphthalene (61.2)	-	-	-	-	-	-	53.4_s	71.2	81.8	-	-	x	(74)
$C_{10}H_8$	Cyclopentacycloheptene (Azulene)(S)	-	-14.5	-9.3	+3.6	9.6	24.4	-	-	-	-	-	c	(48)
$C_{10}H_8$	Naphthalene (S)	-	-	-	-14.3	-10.2	+0.3	5.1	17.9	24.7	47.3	-	c	(20,48,91, 98,103,113)
$C_{10}H_{10}O_4$	Dimethyl phthalate (L)	-	-12.3	-6.5	+7.9	14.6	31.5	39.3	59.6	-	-	-	c	(48,99)
$C_{10}H_{12}N_2O_2$	2-Acetamido acetanilide (S)	(P = 171μ at 90.2°C)											k	(6)
$C_{10}H_{14}$	p-Cymene (L)	-	-	-	-	-	-	-	-	-9.2	+9.4	18.3	g	(62)
$C_{10}H_{14}NO_5PS$	o,o-Diethyl-o-p-nitro-phenyl thiophosphate (L)	-	28.2	34.5	50.4	57.7	76.0	84.6	106.1	116.2	141.9	154.0	a	(110)
$C_{10}H_{14}NO_6P$	o,o-Diethyl-o-p-nitro-phenyl phosphate (L)	-	-	29.4	47.0	55.3	76.3	86.1	111.3	123.3	154.2	169.1	a	(110)
$C_{10}H_{14}O$	Thymol (S)	-	-	-	-0.8	+3.9	15.6	21.0	34.3	40.4	-	-	c	(9)
$C_{10}H_{16}N_2$	Sebaconitrile (L)	-	-	23.8	38.6	45.4	62.6	70.5	-	-	-	-	f	(52)
$C_{10}H_{16}O$	Camphor (S)	-	-	-	-	-	-	-	-1.4	+5.3	22.0	29.8	c	(113)
$C_{10}H_{18}$	cis-Decalin (L)	-	-	-	-	-	-	17.8	34.3	41.9	-	-	c	(114)
$C_{10}H_{18}$	trans-Decalin (L)	-	-	-	-	-	-	16.3	32.9	40.1	-	-	c	(114)
$C_{10}H_{18}O$	α-Terpineol (S)	-	-	-	-	-	-	12.6	27.0	33.6	-	-	c	(95)
$C_{10}H_{19}Cl_2N$	Cyclohexyl-bis-(2-chloroethyl) amine (L)	-	-	+0.4	7.5	25.5	34.0	55.6	-	-	-	-	a	(81)
$C_{10}H_{20}O$	Citronellol (S)	-	-	-	-	-	12.5	20.0	38.6	47.3	69.6	80.1	c	(96)
$C_{10}H_{20}O_2$	Decanoic acid (L)	-	-	-	-	33.6	46.1	51.8	71.2	79.0	-	-	e	(100)
$C_{10}H_{20}O_2$	Octanal-7-hydroxy-3,7-dimethyl (L)	-	-	-	-	11.1	26.2	33.2	50.9	59.1	-	-	c	(97)
$C_{10}H_{22}O$	Decanol (L)	-	-	-	-	+7.0	17.0	22.0	35.4	42.0	-	-	e	(100)

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		0.01μ	0.05μ	0.1μ	0.5μ	1.0μ	5.0μ	10.0μ	50.0μ	100.0μ	500.0μ	1000μ		
$C_{11}H_{22}O_2$	Methyl caprate (L)	-	-	-	-	-	-	-	-	35.5	56.0	66.0	e	(89)
$C_{12}H_8N_2O_4$	4,4-Dinitro diphenyl (S)	-	-	-	-	124.0	145.2	155.1	-	-	-	-	c	(93)
$C_{12}H_9N$	Diphenylenimine (S)	-	-	-	65.6	73.6	93.8	-	-	-	-	-	k	(7)
$C_{12}H_9NS$	Phenothiazine (S)	-	57.8	65.3	84.1	92.9	115.0	125.4	-	-	-	-	a	(68)
$C_{12}H_{10}$	Acenaphthene (S)	-14.7	-3.3	+1.9	14.9	20.9	-	-	-	-	-	-	c	(48)
$C_{12}H_{10}$	Diphenyl (S)	-	-	-	-	+6.2	20.4	27.0	43.5	-	-	-	c	(5,20,23,93)
$C_{12}H_{10}N_2$	cis-Azobenzene (S)	-	-	-	29.0	36.2	54.3	62.8	-	-	-	-	c	(24)
$C_{12}H_{10}N_2$	trans-Azobenzene (S)	-	-	-	27.2	34.3	52.2	60.5	-	-	-	-	c	(24)
$C_{12}H_{10}O$	Diphenyl ether (L)	-	-	-	-	-	-	-	34.8	43.6	66.0	-	a	(13)
$C_{12}H_{11}N$	Diphenylamine (S)	-	-	-	25.6	31.1	44.5	50.6	-	-	-	-	k	(2)
$C_{12}H_{11}N_3$	p-Aminoazobenzene (S)	-	-	-	-	80.3	96.0	103.2	-	-	-	-	c	(65)
$C_{12}H_{14}O_4$	Diethyl phthalate (L)	-	-	-	-	-	44.5	51.7	69.8	-	-	-	c	(99)
$C_{12}H_{15}N_3O_2$	3,6-Bis-(Dimethylamino) phthalimide (S)	-	-	-	-	-	-	127.3	148.9	158.9	184.0	-	f	(53)
$C_{12}H_{16}N_2O_5$	1-Methyl-4-tert-butyl-3-methoxy-2,6-dinitrobenzene(S)	-	29.6	34.9	47.7	53.6	68.1	74.8	-	-	-	-	c	(94)
$C_{12}H_{16}O_3$	2-Methylbutyl-o-hydroxy benzoate(L)	-	-	-	-	+9.7	25.2	32.3	50.4	58.9	-	-	c	(97)
$C_{12}H_{22}$	cis-Dicyclohexyl (L)	-	-	-	-	-	-	-	12.8	20.7	41.7	-	c	(114)
$C_{12}H_{22}$	trans-Dicyclohexyl (L)	-	-	-	-	-	-	-	10.6	17.9	37.5	-	c	(114)
$C_{12}H_{22}FO_3P$	Dicyclohexyl fluorophosphate (L)	-	-	10.4	24.6	31.1	47.4	54.9	-	-	-	-	a	(84)
$C_{12}H_{24}O_2$	Dodecanoic acid (43.3)	25.3_s	33.2_s	36.7_s	46.1	52.0	66.8	73.5	90.3	98.0	-	-	ce	(41,48,64,100)
$C_{12}H_{25}NO$	N-Decyl acetamide (L)	-	-	-	-	-	-	-	-	132.0	156.0	170.0	e	(79)
$C_{12}H_{26}O$	Dodecanol (L)	-	-	-	-	27.0	37.9	43.5	57.2	64.0	-	-	e	(48,100)

Formula	Name	Temperature in Degrees Centigrade at Indicated Pressures in Microns											Method	References
		0.01μ	0.05μ	0.1μ	0.5μ	1.0μ	5.0μ	10.0μ	50.0μ	100.0μ	500.0μ	1000μ		
$C_{13}H_{10}$	Fluorene (S)	-	-	-	-	28.6	44.2	51.3	-	-	-	-	c	(20)
$C_{13}H_{10}AsN$	Diphenyl cyanoarsine (L)	-	-	-	42.0	48.9	66.2	-	-	-	-	-	c	(9)
$C_{13}H_{10}O$	Benzophenone, (L)	-	-	-	17.7	24.1	40.0	47.4	66.0	-	-	-	c	(69)
$C_{13}H_{10}O$	Benzophenone, (S)	-	-	11.3	23.1	28.5	41.9	-	-	-	-	-	c	(69)
$C_{13}H_{10}O$	Benzophenone, (S, unstable)	-	-	7.1	19.0	24.4	-	-	-	-	-	-	c	(69)
$C_{13}H_{12}$	Diphenyl methane (S)	-	-	-	-4.2	+2.5	19.4	-	-	-	-	-	c	(23)
$C_{13}H_{18}O$	2-Methyl-3-(p-isopropyl phenyl) propionaldehyde (L)	-	-	-	-	+6.9	22.1	29.2	47.0	55.4	-	-	c	(96)
$C_{13}H_{22}$	cis-2-Propen-decalin (L)	-	-	-	-	-	26.9	33.1	47.1	-	-	-	c	(114)
$C_{13}H_{22}$	trans-2-Propen-decalin (L)	-	-	-	-	-	25.6	31.3	45.5	-	-	-	c	(114)
$C_{13}H_{26}O_2$	Methyl laurate (L)	-	-	-	-	13.7	28.0	34.9	51.6	59.6	81.3	92.0	e	(89, 100)
$C_{14}H_8O_2$	Anthraquinone (S)	68.8	81.6	87.5	101.5	108.3	124.4	131.7	-	-	-	-	c	(48)
$C_{14}H_8O_2$	9,10-Phenanthraquinone (S)	82.8	96.1	102.1	117.0	123.7	140.4	-	-	-	-	-	c	(48)
$C_{14}H_8O_3$	1-Hydroxyanthraquinone (S)	61.1	74.0	79.8	94.2	100.8	-	-	-	-	-	-	c	(48)
$C_{14}H_8O_3$	2-Hydroxyanthraquinone (S)	122.2	136.4	142.8	158.5	165.6	183.1	-	-	-	-	-	c	(48)
$C_{14}H_8O_4$	1,2-Dihydroxyanthraquinone (S)	95.2	110.5	117.4	134.7	142.5	162.1	-	-	-	-	-	c	(48)
$C_{14}H_8O_4$	1,4-Dihydroxyanthraquinone (S)	-	-	91.3	106.2	113.1	130.0	137.7	-	-	-	-	c	(48)
$C_{14}H_8O_4$	1,5-Dihydroxyanthraquinone (S)	92.5	107.2	113.9	130.4	137.9	156.6	-	-	-	-	-	c	(48)
$C_{14}H_8O_4$	1,8-Dihydroxyanthraquinone (S)	68.0	81.2	87.2	101.9	108.6	125.2	132.7	-	-	-	-	c	(48)
$C_{14}H_8O_4$	2,6-Dihydroxyanthraquinone (S)	-	203.4	211.1	229.8	238.4	259.3	-	-	-	-	-	c	(48)
$C_{14}H_8O_6$	1,4,5,8-Tetrahydroxyanthraquinone(S)	134.4	149.6	156.6	173.5	181.2	200.2	-	-	-	-	-	c	(48)
$C_{14}H_9Cl_5$	1,1,1-Trichloro-2,2-bis (chlorophenyl)ethane (DDT)(S)	-	-	65.5	79.0	85.2	100.4	-	-	-	-	-	c	(9)
$C_{14}H_{10}$	Anthracene (S)	-	-	-	-	69.1	85.6	93.1	111.8	120.5	142.2	-	c,f	(20,48,53,73,91)
$C_{14}H_{10}$	Phenanthrene (S)	-	-	-	34.5	40.9	57.0	-	-	-	-	-	c	(20,48)

Formula	Name	Temperature in Degrees Centigrade at Indicated Pressures in Microns										Method	References
		0.01μ	0.05μ	0.1μ	0.5μ	1.0μ	5.0μ	10.0μ	50.0μ	100.0μ	500.0μ	1000μ	
$C_{14}H_{12}O_3$	Benzyl salicylate (L)	-	-	21.4	36.9	44.1	62.2	70.7	-	-	-	-	c	(97)
$C_{14}H_{14}$	Dibenzyl (S)	-	-	-	14.3	21.0	37.9	45.8	-	-	-	-	c	(23)
$C_{14}H_{15}N_3$	N,N'-Dimethyl-p-amino-azobenzene (S)	-	-	-	-	86.0	100.8	107.6	-	-	-	-	c	(65)
$C_{14}H_{18}N_2O_5$	2,6-Dimethyl-3,5-dinitro-4-tert-butyl-acetophenone (S)	-	48.4	54.0	67.9	74.2	89.9	-	-	-	-	-	c	(94)
$C_{14}H_{18}O$	2-Pentyl-3-phenyl propenal (L)	-	-	-	16.1	22.6	39.0	46.6	65.9	-	-	-	c	(97)
$C_{14}H_{18}O_4$	Dipropyl phthalate (L)	-	-	-	36.6	42.9	58.8	66.1	84.4	-	-	-	c	(99)
$C_{14}H_{28}O_2$	Tetradecanoic acid (L)	-	-	-	61.5	68.0	81.8	89.5	107.5	116.5	-	-	e	(41,48,50,100)
$C_{14}H_{30}$	n-Tetradecane (S)	-	-17.5	-13.8	-4.8	-0.7	-	-	-	-	-	-	c	(48)
$C_{14}H_{30}O$	1-Tetradecanol (L)	-	-	-	-	44.5	55.5	61.5	77.3	85.0	-	-	e	(48,100)
$C_{15}H_{11}NO_2$	1-Methylamino anthraquinone (S)	-	-	-	-	113.4	129.6	136.9	-	-	-	-	c	(17)
$C_{15}H_{12}$	9-Methyl anthracene (L)	-	-	-	-	-	-	81.8	99.7	108.0	128.7	-	f	(53)
$C_{15}H_{26}O_6$	Tributyrin (L)	-	-	-	-	44.7	62.2	70.4	91.0	-	-	-	e	(78)
$C_{15}H_{30}O_2$	Methyl myristate (L)	-	-	-	-	34.0	48.3	54.5	73.5	81.6	104.6	114.5	e	(89,100)
$C_{15}H_{32}$	Pentadecane (L)	-	-	-	-	-	-	14.0	35.5	44.5	-	-	c	(40,106)
$C_{16}H_{10}$	Fluoranthene (S)	30.0	42.5	48.2	62.3	68.7	84.7	-	-	-	-	-	c	(48)
$C_{16}H_{10}$	Pyrene (S)	-	-	-	63.5	70.5	88.2	-	-	-	-	-	c	(20, 48)
$C_{16}H_{13}NO$	9-Acetamide anthracene (S)	-	-	-	-	-	-	173.1	193.8	203.3	226.8	-	f	(53)
$C_{16}H_{13}NO_3$	1-(2-Hydroxyethyl amino) anthraquinone (S)	-	-	-	-	150.5	166.8	174.3	-	-	-	-	c	(17)
$C_{16}H_{14}$	9,10-Dimethyl anthracene (S)	-	-	-	-	-	-	108.1	127.9	137.1	160.1	--	f	(53)
$C_{16}H_{14}$	1,4-Diphenyl butadiene-1,3 (S)	-	-	-	-	-	-	89.4	110.8	120.8	-	-	f	(53)

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		0.01μ	0.05μ	0.1μ	0.5μ	1.0μ	5.0μ	10.0μ	50.0μ	100.0μ	500.0μ	1000μ		
$C_{16}H_{18}Cl_4O_4$	Di-n-butyl tetrachlorophthalate(L)	-	-	-	-	93.7	112.7	121.5	143.6	-	-	-	e	(77)
$C_{16}H_{22}O_4$	Dibutyl phthalate (L)	17.1	30.0	35.8	49.8	56.6	73.0	80.7	100.8	110.0	135.6	149.0	cehj	(14,42,44,45,48,51 77,79,99,107,108)
$C_{16}H_{22}O_4$	Di-(sec-butyl)phthalate (L)	-	-	-	43.9	50.2	65.8	73.0	91.0	-	-	-	c	(99)
$C_{16}H_{32}O_2$	Hexadecanoic acid (L)	-	-	-	76.2	82.5	97.5	104.8	123.2	132.0	-	-	e	(48,100)
$C_{16}H_{34}$	Hexadecane (17)	-	-	-	15.8_s	21.8	36.9	44.0	61.6	-	-	-	c	(22,40,48,76,106)
$C_{16}H_{34}O$	1-Hexadecanol (49.5)	-	39.4_s	42.8_s	52.2	57.5	73.0	78.0	94.1	102.8	-	-	ce	(48,100)
$C_{17}H_{34}O_2$	Methyl palmitate (L)	-	-	35.6	47.7	53.5	67.9	74.2	92.9	101.8	125.7	137.3	e	(89,100)
$C_{17}H_{36}$	Heptadecane (23.4)	-	-	16.1_s	25.7	32.0	47.7	-	-	-	-	-	c	(22,106)
$C_{18}H_{12}$	1,2-Benzanthracene (S)	61.4	74.4	80.4	-	-	-	-	-	-	-	-	c	(48)
$C_{18}H_{12}$	Chrysene (S)	77.7	91.8	98.2	114.1	121.4	139.3	-	-	-	-	-	c	(48)
$C_{18}H_{14}$	1,3-Diphenylbenzene (S)	-	48.5	53.6	66.1	71.8	85.7	-	-	-	-	-	c	(48)
$C_{18}H_{14}$	1,4-Diphenylbenzene (S)	64.5	77.6	83.6	98.3	105.1	121.6	-	-	-	-	-	c	(48)
$C_{18}H_{15}NO_2$	9-Diacetylamino anthracene (S)	-	-	-	-	-	-	126.4	147.5	157.3	182.0	-	f	(53)
$C_{18}H_{15}O_4P$	Triphenyl phosphate (L)	(0.66μ at 100°C)											c	(99)
$C_{18}H_{24}O_4$	Butylcyclohexyl phthalate (L)	-	-	-	-	-	91.7	100.0	120.9	130.6	-	-	ch	(108)
$C_{18}H_{26}O_4$	Di-n-pentyl phthalate (L)	35.0	46.7	51.6	65.6	71.7	87.7	95.3	118.0	125.0	155.6	164.0	cej	(42,77,99)
$C_{18}H_{34}O_4$	Dibutyl sebacate (L)	-	-	48.9	64.0	71.1	88.7	97.4	117.3	-	-	-	ce	(41,77,99)
$C_{18}H_{36}$	n-Dodecyl cyclohexane (L)	-	-	-	37.3	43.3	58.4	-	-	-	-	-	c	(76)
$C_{18}H_{36}$	n-Octadecene-1 (18)	+4.6	14.5	19.0	-	-	-	-	-	-	-	-	c	(48)
$C_{18}H_{36}O_2$	Octadecanoic acid (L)	-	-	76.5	89.7	96.0	111.5	119.0	138.6	148.0	-	-	e	(100)
$C_{18}H_{38}$	Octadecane (29.3)	14.1_s	21.5_s	24.8_s	35.2	41.4	-	-	-	-	-	-	c	(22)

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		0.01μ	0.05μ	0.1μ	0.5μ	1.0μ	5.0μ	10.0μ	50.0μ	100.0μ	500.0μ	1000μ		
$C_{18}H_{38}O$	1-Octadacanol (L)	-	-	-	-	71.0	85.9	94.5	114.0	121.4	-	-	e	(100)
$C_{18}H_{39}O_7P$	Tris-(Butoxyethyl)phosphate(L)	-	-	-	-	96.9	114.4	122.4	-	-	-	-	c	v (98)
$C_{19}H_{32}O_2$	Methyl linolenate (L)	-	-	-	-	-	-	-	-	118.4	143.0	155.0	e	(89)
$C_{19}H_{34}O_2$	Methyl linoleate (L)	-	-	-	-	-	-	-	-	117.0	141.9	154.0	e	(89)
$C_{19}H_{36}O_2$	Methyl oleate (L)	-	-	-	-	-	-	-	-	118.2	142.4	154.4	e	(89)
$C_{19}H_{38}O_2$	Methyl stearate (L)	-	-	51.4	63.4	69.0	83.7	91.0	110.4	120.0	146.1	158.2	e	(89,100)
$C_{20}H_{12}$	Perylene (S)	110.0	124.6	131.3	147.7	155.2	173.6	182.0	-	-	-	-	c	(48)
$C_{20}H_{14}$	9-Phenyl anthracene (S)	-	-	-	-	-	-	121.0	139.9	148.6	-	-	f	(53)
$C_{20}H_{22}N_2O_2$	1,4-Bis-(Propylamino) anthraquinone (L)	-	-	-	-	-	165.6	175.2	199.1	-	-	-	e	(45)
$C_{20}H_{26}O_4$	Dicyclohexyl phthalate (L)	-	-	-	-	-	-	118.6	140.9	151.4	-	-	ch	(108)
$C_{20}H_{30}O_4$	Di-n-hexyl phthalate (L)	48.0	60.2	65.9	79.8	86.5	103.6	111.8	132.0	141.7	165.6	179.0	cj	(42, 99)
$C_{20}H_{34}O_{11}$	Diglycol bis(carbonate of butyl lactate) (L)	-	-	-	-	-	-	147.0	170.0	180.0	208.0	250.0	e	(79)
$C_{20}H_{38}O_4$	Di-n-pentyl sebacate (L)	-	-	-	-	86.1	104.4	112.8	134.0	-	-	-	e	(77)
$C_{20}H_{38}O_6$	2,2'-Ethylenedioxy diethyl heptanoate (S)	39.4	54.0	60.8	77.6	85.3	-	-	-	-	-	-	c	(48)
$C_{20}H_{40}O_2$	Decyl decanoate (L)	-	-	-	-	68.0	85.0	92.9	114.9	125.0	-	-	e	(100)
$C_{20}H_{40}O_2$	Eicosanoic acid (L)	-	-	88.0	102.4	109.0	126.4	135.0	155.8	-	-	-	e	(100)
$C_{20}H_{40}O_2$	Ethyl octadecanoate (L)	-	-	-	-	68.0	85.0	92.9	114.9	125.0	-	-	e	(100)
$C_{20}H_{40}O_2$	Octadecyl acetate (L)	-	-	-	-	68.0	85.0	92.9	114.9	124.8	-	-	e	(100)

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		0.01μ	0.05μ	0.1μ	0.5μ	1.0μ	5.0μ	10.0μ	50.0μ	100.0μ	500.0μ	1000μ		
$C_{21}H_{21}O_4P$	Tri-m-tolyl phosphate (L)	-	81.1	87.4	102.9	110.1	127.7	135.8	-	-	-	-	ce	(99,107)
$C_{21}H_{21}O_4P$	Tri-p-tolyl phosphate (L)	-	-	92.1	108.6	116.1	135.0	144.2	168.0	-	-	-	ce	(77,99,107)
$C_{21}H_{36}O_3S$	Phenyl pentadecane sulfonate	(Mesamoll IV)(L)				(1.6×10^{-1}μ at 100°C)							c	(99)
$C_{21}H_{38}O_6$	Tricaproin (L)	-	-	-	-	85.0	104.1	113.0	135.2	-	-	-	e	(78)
$C_{22}H_{16}O$	3,8-Dimethyl ceroxene(S)	95.0	108.6	114.8	129.9	136.8	153.7	161.5	-	-	-	-	c	(48)
$C_{22}H_{18}O_4$	Di-benzyl phthalate (L)	-	-	-	-	-	-	-	-	182.0	-	224.0	j	(42)
$C_{22}H_{34}O_2$	Ethyl abietate(L)					(9.3μ at 100°C)							c	(99)
$C_{22}H_{34}O_4$	Di-n-heptyl phthalate (L)	63.0	-	80.0	-	100.0	-	125.0	-	156.0	-	195.0	j	(42)
$C_{22}H_{42}O_4$	Diisooctyl adipate (L)	-	-	-	-	85.0	104.0	112.8	135.0	-	-	-	e	(77)
$C_{22}H_{42}O_6$	Bis-butoxyethyl sebacate (L)	-	-	89.4	104.6	111.6	128.8	136.7	156.2	-	-	-	c	(99)
$C_{22}H_{44}O_2$	Butyl stearate (L)	-	-	-	-	77.6	94.9	102.9	122.9	-	-	-	e	(77)
$C_{22}H_{44}O_2$	Docosanoic acid (L)	-	-	100.0	115.1	122.0	140.0	148.0	-	-	-	-	e	(100)
$C_{24}H_{12}$	Coronene (S)	162.4	180.4	188.6	208.9	218.2	241.2	-	-	-	-	-	c	(48)
$C_{24}H_{20}O_6$	Tribenzoin (L)	-	-	-	-	148.4	168.6	177.9	201.1	-	-	-	e	(78)
$C_{24}H_{22}O_4$	β-Ethyl phenyl phthalate (L)	-	-	-	-	-	-	-	-	196.0	-	237.0	j	(42)
$C_{24}H_{30}O_4$	Di-benzyl sebacate (L)	-	-	108.1	125.0	132.8	152.3	161.4	184.9	-	-	-	ce	(77,99,107)
$C_{24}H_{38}O_4$	2-Ethylhexyl phthalate (L)	-	-	-	-	99.6	117.9	126.2	147.3	157.1	181.8	193.2	ceh	(45,77,79,108)
$C_{24}H_{38}O_4$	Dioctyl phthalate (L)	-	-	-	-	109.7	128.4	137.0	158.6	169.0	200.3	209.4	cehj	(42,48,77,79)
$C_{24}H_{38}O_4$	Di-isooctyl phthalate (L)	-	-	-	-	-	111.2	120.7	144.5	155.6	-	-	ch	(108)
$C_{24}H_{46}O_4$	Bis-(3,5,5-trimethyl hexyl)adipate (L)	-	-	84.9	91.9	109.3	117.3	137.2	146.4	-	-	-	c	(99)
$C_{24}H_{51}O_4P$	Tris-(2-ethylhexyl) phosphate (L)	-	-	-	86.7	93.5	110.4	118.2	137.6	-	-	-	c	(99)

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		0.01μ	0.05μ	0.1μ	0.5μ	1.0μ	5.0μ	10.0μ	50.0μ	100.0μ	500.0μ	1000μ		
$C_{26}H_{18}$	9,10-Diphenyl anthracene (S)	-	-	-	-	-	-	168.0	191.5	202.5	230.0	-	f	(53)
$C_{26}H_{42}O_4$	Bis-(3,5,5-trimethyl hexyl) phthalate (L)	58.8	74.3	79.3	95.1	102.3	120.3	128.9	-	-	-	-	c	(48,99)
$C_{26}H_{42}O_4$	Di-n-nonyl phthalate (L)	73.5	89.0	96.0	113.6	121.7	141.7	150.9	173.6	184.3	210.8	223.0	j	(42,48)
$C_{26}H_{50}O_4$	Bis-(2-ethylhexyl)sebacate (L)	-	-	91.1	107.8	115.4	134.2	143.0	164.7	-	-	-	ce	(77,99)
$C_{27}H_{46}O$	Cholesterol (L)	-	-	-	-	-	148.4	157.5	180.3	-	-	-	e	(45)
$C_{27}H_{50}O_6$	Tricaprylin (L)	-	-	-	-	127.6	147.1	156.0	178.4	-	-	-	e	(78)
$C_{27}H_{57}O_4P$	Tris-(3,5,5-trimethyl hexyl)phosphate (L)	-	-	77.7	93.8	101.1	119.5	127.9	-	-	-	-	c	(99)
$C_{28}H_{18}$	9,9'-Bianthryl (S)	133.6	151.7	160.0	180.6	190.0	-	-	-	-	-	-	c	(48)
$C_{28}H_{44}O$	Ergosterol (L)	-	-	-	-	-	160.3	167.4	192.9	-	-	-	e	(45)
$C_{28}H_{46}O_4$	Dicapryl phthalate (L)	-	-	-	-	-	113.4	122.8	146.7	157.9	-	-	ch	(108)
$C_{28}H_{54}O_4$	Bis-(3,5,5-trimethyl hexyl)sebacate (L)	(1.4×10^{-3} μ at 100°C)											c	(99)
$C_{30}H_{34}O_4$	Butyl benzyl phthalate (L)	21.2	34.5	40.6	55.8	62.8	80.4	-	-	-	-	-	c	(48)
$C_{33}H_{62}O_6$	Tricaprin (L)	-	-	-	-	158.5	179.5	189.2	213.4	-	-	-	e	(78)
$C_{36}H_{62}O_4$	Di-(n-tetradecyl)phthalate (L)	-	-	-	-	138.9	157.7	166.4	187.9	-	-	-	e	(77)
$C_{38}H_{74}O_4$	Di-(n-tetradecyl)sebacate (L)	-	-	-	-	158.0	177.2	186.0	207.8	-	-	-	e	(77)

Formula	Name	Temperature in Degrees Centigrade at Indicated Pressures in Microns											Method	References
		0.01μ	0.05μ	0.1μ	0.5μ	1.0μ	5.0μ	10.0μ	50.0μ	100.0μ	500.0μ	1000μ		
$C_{39}H_{74}O_6$	Glyceryl caprolauromyristate (L)	-	-	-	-	188.6	211.3	221.8	248.0	-	-	-	e	(78)
$C_{39}H_{74}O_6$	Trilaurin (L)	-	-	-	-	188.3	210.0	220.0	244.8	-	-	-	e	(78)
$C_{42}H_{28}$	Rubrene (S)	175.6	193.1	201.0	220.5	229.4	251.3	-	-	-	-	-	c	(48)
$C_{45}H_{86}O_6$	Glyceryl lauromyristopalmitate (L)	-	-	-	-	215.4	238.1	248.5	274.3	-	-	-	e	(78)
$C_{45}H_{86}O_6$	Glyceryl myristocaprylostearate (L)	-	-	-	-	214.9	237.4	247.6	273.4	-	-	-	e	(78)
$C_{45}H_{86}O_6$	Trimyristin (L)	-	-	-	-	216.1	238.7	249.2	275.1	-	-	-	e	(78)
$C_{47}H_{90}O_6$	Glyceryl myristolaurostearate (L)	-	-	-	-	223.0	246.0	256.5	282.7	-	-	-	e	(78)
$C_{47}H_{90}O_6$	Glyceryl palmitocaprylostearate (L)	-	-	-	-	223.2	245.4	255.6	280.9	-	-	-	e	(78)
$C_{49}H_{94}O_6$	Glyceryl palmitolaurostearate (L)	-	-	-	-	232.0	254.2	264.5	289.8	-	-	-	e	(78)
$C_{51}H_{98}O_6$	Glyceryl myristopalmitostearate (L)	-	-	-	-	236.7	259.8	270.6	296.6	-	-	-	e	(78)
$C_{51}H_{98}O_6$	Tripalmitin (L)	-	-	-	229.8	239.0	261.8	272.3	298.2	-	-	-	e	(78)
$C_{57}H_{108}O_6$	2-Oleyl-1,3-distearin (L)	-	-	-	-	254.2	277.7	288.4	315.1	-	-	-	e	(78)
$C_{57}H_{110}O_6$	Tristearin (L)	-	-	-	244.6	254.0	277.1	287.7	314.0	-	-	-	e	(78)
	Olive oil (L)	-	-	-	-	253.1	274.4	284.2	308.2	-	-	-	e	(78)
	Dow-Corning Silicone oils (DC-702) (L)	-	-	-	-	86.0	105.7	114.9	138.1	-	-	-	e	(78)
	Dow-Corning Silicone oils (DC-703) (L)	-	-	-	118.0	127.0	149.7	160.3	-	-	-	-	e	(78)
	Soybean oil (L)	-	-	-	-	254.2	275.1	284.6	-	-	-	-	e	(78)
	Vacuum pump oils (L)												cn	(37, 51)

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