

# Vapor Pressures and Freezing Points of 30 Organics

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The vapor pressures of 30 purified samples of organic compounds have been determined by a dynamic boiling point method (3). For 29 compounds, the constants in the Antoine vapor pressure equation were determined from experimental data by a least squares method using an automatic computer.

For pentachlorophenol, the constants were determined from a plot of  $\log p$ ,  $1/T$  ( $T$  in  $^{\circ}\text{K}$ ). Eight solid state vapor pressures, a heat of fusion of 7000 cal. per mole, and the selected vapor pressures (2) were considered in determining the "best straight line" through three liquid state vapor pressures. The Knudsen effusion technique (1) was used by G. C. Sinke of these laboratories to determine the solid state vapor pressures.

The standard deviation,  $\sigma$ , of the temperature differences is included in Table I.

The samples were analyzed by freezing curve techniques (3) except as noted in Table II, and all were better than 99.5 mole % pure, assuming ideal behavior. The freezing point and purity data and the Antoine constants are listed in Table II. Temperatures calculated at selected pressures are in Table III.

## LITERATURE CITED

- (1) Knudsen, M., *Ann. Physik* **28**, 75, 999 (1909); **29**, 179 (1909).
- (2) Stull, D. R., *Ind. Eng. Chem.* **39**, 517-50 (1947).
- (3) Stull, D. R., *Ind. Eng. Chem., Anal. Ed.* **18**, 234-42 (1946).

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Table I. Experimental Vapor Pressure Points of Thirty Organic Compounds

The last figure given under mm. Hg and under  $^{\circ}\text{C}$ . is uncertain. The data above 300 mm. Hg are more reliable than those below.

$^{\circ}\text{C}$ .				$^{\circ}\text{C}$ .				$^{\circ}\text{C}$ .				
Mm. Hg	Obsd.	Calcd.	Obsd. - Calcd.	Mm. Hg	Obsd.	Calcd.	Obsd. - Calcd.	Mm. Hg	Obsd.	Calcd.	Obsd. - Calcd.	
CBrF <sub>3</sub> $\sigma = 0.000$ Methane, Bromotrifluoro-				C <sub>2</sub> H <sub>2</sub> Cl <sub>2</sub> O $\sigma = 0.013$ Acetyl Chloride, Chloro-				C <sub>2</sub> H <sub>4</sub> O $\sigma = 0.021$ Ethylene Oxide				
783.67	-57.24	-57.24	0.00	786.1	107.07	107.06	0.01	779.11	11.06	11.07	-0.01	
743.19	-58.36	-58.36	0.00	766.1	106.22	106.23	-0.01	769.50	10.76	10.76	0.00	
729.11	-58.76	-58.76	0.00	742.9	105.26	105.25	0.01	760.79	10.48	10.47	0.01	
				729.6	104.66	104.68	-0.02	760.0	10.45	10.44	0.01	
CBr <sub>2</sub> F <sub>2</sub> $\sigma = 0.011$ Methane, Dibromodifluoro-					389.2	85.97	85.95	0.02	730.91	9.50	9.50	0.00
				189.5	67.08	67.08	0.00	539.01	2.02	2.06	-0.04	
782.57	23.63	23.61	0.02	90.87	50.17	50.17	0.00	345.51	-8.00	-8.01	0.01	
760.00	22.79	22.79	0.00	50.67	38.13	38.14	-0.01	153.42	-24.38	-24.42	0.04	
749.30	22.39	22.39	0.00	30.08	28.33	28.32	0.01	105.38	-31.26	-31.26	0.00	
730.14	21.65	21.67	-0.02					95.27	-33.01	-33.02	0.01	
389.69	5.19	5.20	-0.01					85.71	-34.88	-34.84	-0.04	
190.30	-11.34	-11.35	0.01	C <sub>2</sub> H <sub>3</sub> Cl $\sigma = 0.044$ Ethylene, Chloro-								
91.82	-26.15	-26.15	0.00	785.30	-13.00	-13.00	0.00	C <sub>2</sub> H <sub>4</sub> O <sub>2</sub> $\sigma = 0.043$ Acetic Acid				
				765.40	-13.64	-13.63	-0.01	767.45	118.14	118.18	-0.04	
CH <sub>2</sub> BrCl $\sigma = 0.108$ Methane, Bromochloro-				728.55	-14.83	-14.83	0.00	756.82	117.71	117.72	-0.01	
760.00	68.00	68.07	-0.07	388.92	-29.09	-29.08	-0.01	746.94	117.27	117.30	-0.03	
719.65	66.32	66.37	-0.05	188.37	-43.37	-43.43	0.06	736.37	116.83	116.83	0.00	
526.37	57.18	57.01	0.17	91.11	-56.04	-55.96	-0.08	706.23	115.51	115.48	0.03	
335.52	44.71	44.70	0.01	50.77	-64.90	-64.93	0.03	511.62	105.49	105.41	0.08	
141.07	24.06	24.19	-0.13					317.29	91.49	91.50	-0.01	
93.34	15.72	15.64	0.07	C <sub>2</sub> H <sub>3</sub> ClO $\sigma = 0.086$ Acetyl Chloride				123.89	67.20	67.22	-0.02	
				767.45	51.05	51.07	-0.02	74.99	55.63	55.68	-0.05	
				756.82	50.64	50.66	-0.02	64.23	52.36	52.30	0.06	
				746.94	50.23	50.27	-0.04	C <sub>2</sub> H <sub>7</sub> NO $\sigma = 0.073$ Ethanol, 2-Amino-				
				736.37	49.83	49.86	-0.03	760.00	170.37	170.39	-0.02	
				706.23	48.66	48.64	0.02	731.94	169.20	169.20	0.00	
				511.62	39.68	39.62	0.06	539.01	159.79	159.76	0.03	
				317.29	27.41	27.32	0.09	153.42	125.73	125.76	-0.03	
				123.89	6.17	6.25	-0.08	105.38	116.79	116.85	-0.06	
				74.99	-3.73	-3.58	-0.15	95.27	114.55	114.55	0.00	
				64.23	-6.29	-6.44	0.15	85.71	112.29	112.17	0.12	
								75.44	109.43	109.35	0.08	
								65.31	106.10	106.22	-0.12	
				C <sub>2</sub> H <sub>3</sub> ClO <sub>2</sub> $\sigma = 0.026$ Acetic Acid, Chloro-				C <sub>3</sub> H <sub>6</sub> O $\sigma = 0.040$ Propylene Oxide				
767.45	197.93	197.94	-0.01	785.6	190.27	190.24	0.03	774.8	34.75	34.76	-0.01	
756.82	197.48	197.44	0.04	766.3	189.35	189.38	-0.03	730.4	33.11	33.13	-0.02	
746.94	197.02	196.97	0.05	729.1	187.69	187.68	0.01	389.8	17.05	16.98	0.07	
736.37	196.49	196.46	0.03	389.4	167.51	167.50	0.01	190.1	0.77	0.80	-0.03	
706.23	194.91	194.98	-0.07	189.0	146.78	146.82	-0.04	91.28	-13.66	-13.64	-0.02	
511.62	183.92	183.94	-0.02	90.78	128.22	128.20	0.02	49.99	-24.17	-24.19	0.02	
317.29	168.75	168.76	-0.01	50.07	114.60	114.58	0.02					
74.99	129.99	129.96	0.03	31.06	104.47	104.49	-0.02					
54.95	122.75	122.74	0.01									
44.62	118.13	118.10	0.03									
34.65	112.62	112.66	-0.04									

Table I. (Continued)

°C.				°C.				°C.			
Mm. Hg	Obsd.	Calcd.	Obsd.- Calcd.	Mm. Hg	Obsd.	Calcd.	Obsd.- Calcd.	Mm. Hg	Obsd.	Calcd.	Obsd.- Calcd.
$C_4H_6O_3$ $\sigma = 0.040$ Acetic Anhydride				$C_6H_7N$ $\sigma = 0.053$ Aniline				$C_{10}H_{14}$ $\sigma = 0.028$ <i>m</i> -Cymene			
777.41	139.42	139.42	0.00	784.48	185.15	185.22	-0.07	786.7	176.33	176.27	0.06
767.45	138.98	138.97	0.01	764.40	184.24	184.22	0.02	752.2	174.52	174.50	0.02
756.82	138.48	138.49	-0.01	728.33	182.40	182.38	0.02	729.6	173.34	173.31	0.03
746.94	138.02	138.04	-0.02	389.38	160.08	160.01	0.07	389.7	150.06	150.23	-0.17
736.37	137.52	137.55	-0.03	190.73	137.50	137.50	0.00	189.2	126.63	126.74	-0.11
706.23	136.12	136.12	0.00	92.22	117.22	117.29	-0.07	90.51	105.78	105.60	0.18
511.62	125.56	125.52	0.04	51.06	102.59	102.55	0.04	50.34	90.68	90.51	0.17
317.29	111.03	110.99	0.04					30.88	78.76	78.94	-0.18
123.89	85.81	85.89	-0.08								
74.99	74.10	74.09	0.01								
64.23	70.73	70.65	0.08								
54.95	67.26	67.26	0.00								
44.62	62.84	62.88	-0.04								
$C_4H_{11}NO_2$ $\sigma = 0.059$ Ethanol, 2,2'-Imino di-				$C_6H_{15}NO_3$ $\sigma = 0.118$ Ethanol, 2,2',2''-Nitrilo tri-				$C_{10}H_{14}$ $\sigma = 0.028$ <i>p</i> -Cymene			
345.51	241.32	241.32	0.00	345.51	305.6	305.68	-0.08	784.21	178.42	178.38	0.04
153.42	216.75	216.70	0.05	105.38	266.9	266.81	0.09	764.68	177.36	177.36	0.00
105.38	206.16	206.28	-0.12	95.27	264.0	263.78	0.22	748.50	176.46	176.50	-0.04
95.27	203.64	203.57	0.07	85.71	260.6	260.66	-0.06	727.30	175.35	175.36	-0.01
85.71	200.78	200.77	0.01	75.44	256.9	256.95	-0.05	388.12	151.90	151.87	0.03
75.44	197.44	197.45	-0.01	65.31	252.7	252.82	-0.12	188.93	128.24	128.26	-0.02
65.31	193.78	193.77	0.01					90.20	107.04	107.04	0.00
$C_8H_8Cl_2O_2$ $\sigma = 0.027$ Ethanol, 2-(2,4-Dichlorophenoxy)-				$C_{10}H_{14}O$ $\sigma = 0.111$ Phenol, <i>o</i> -tert. Butyl-				$C_{10}H_{14}O$ $\sigma = 0.111$ Phenol, <i>o</i> -tert. Butyl-			
				526.37	286.30	286.29	0.01	784.49	225.43	225.41	0.02
				333.52	267.66	267.67	-0.01	764.40	224.35	224.32	0.03
				141.07	236.46	236.48	-0.02	749.84	223.51	223.51	0.00
				93.34	223.10	223.07	0.03	728.85	222.34	222.33	0.01
				83.61	219.68	219.65	0.03	389.38	197.67	197.78	-0.11
				73.84	215.87	215.86	0.01	189.87	172.82	172.88	-0.06
				63.86	211.48	211.52	-0.04	91.32	150.71	150.48	0.23
								51.64	134.65	134.78	-0.13
$C_8H_9Br$ $\sigma = 0.117$ Benzene, 2-Bromoethyl-				$C_8H_9Br$ $\sigma = 0.117$ Benzene, 2-Bromoethyl-				$C_{12}H_{18}$ $\sigma = 0.044$ Benzene, <i>p</i> -Diisopropyl-			
				786.41	217.18	217.07	0.11				
				765.50	216.08	215.99	0.09				
				729.11	213.88	214.05	-0.17	784.76	211.58	211.56	0.02
				389.53	190.31	190.44	-0.13	765.78	210.49	210.51	-0.02
				189.27	166.19	166.07	0.12	729.63	208.42	208.44	-0.02
				90.38	143.77	143.76	0.01	390.47	183.59	183.57	0.02
				49.90	127.45	127.48	-0.03	190.98	158.71	158.66	0.05
								92.54	136.50	136.58	-0.08
								50.65	120.26	120.23	0.03
$C_6H_4Cl_2$ $\sigma = 0.013$ Benzene, 1,2-Dichloro-				$C_9H_{19}NO$ $\sigma = 0.046$ 2-Propanol, 1-Cyclohexylamino-				$C_{14}H_{14}O_2$ $\sigma = 0.149$ Ethanol, 2-(2-Biphenyloxy)-			
				760.00	238.07	238.05	0.02				
				719.65	235.80	235.78	0.02				
				526.37	223.15	223.20	-0.05	333.52	299.54	299.54	0.00
				141.07	177.79	177.83	-0.04	141.07	267.17	267.28	-0.11
				93.34	165.77	165.70	0.07	93.34	253.22	253.14	0.08
				73.84	159.23	159.18	0.05	83.61	249.65	249.51	0.14
				63.86	155.26	155.27	-0.01	73.84	245.60	245.47	0.13
				53.13	150.40	150.45	-0.05	63.86	240.60	240.84	-0.24
$C_6H_4Cl_2$ $\sigma = 0.037$ Benzene, 1,4-Dichloro-				$C_{10}H_{14}$ $\sigma = 0.104$ <i>o</i> -Cymene				$C_{14}H_{22}O$ $\sigma = 0.049$ Phenol, <i>p</i> -(1,1,3,3-Tetramethylbutyl)-			
				785.45	179.71	179.61	0.10	779.11	291.62	291.57	0.05
				766.60	178.66	178.64	0.02	760.79	290.49	290.45	0.04
				730.41	176.70	176.73	-0.03	731.94	288.57	288.65	-0.08
				389.53	153.23	153.37	-0.14	539.01	274.89	274.90	-0.01
				188.84	129.48	129.53	-0.05	345.41	256.34	256.36	-0.02
				91.55	108.55	108.45	0.10	95.27	210.81	210.78	0.03
				50.84	93.16	93.03	0.13	85.71	207.50	207.48	0.02
				31.28	81.17	81.30	-0.13	75.44	203.51	203.59	-0.08
								65.31	199.32	199.28	0.04

Table II. The Purities, Freezing Points, and Antoine Constants of Thirty Organic Compounds

The last figure given for purity and for freezing point is uncertain. The *C* constant is quoted to six significant figures only because they are used by the automatic computer.

Formula	Name	Purity, Mole %	Freezing Pt., °C.	Antoine Constants		
				A	B	C
CBrF <sub>3</sub>	Methane, bromotrifluoro-	99.9 <sup>a</sup>	$\alpha$ -174.43 $\beta$ -174.68	7.46062	1018.31	280.236
CBr <sub>2</sub> F <sub>2</sub>	Methane, dibromodifluoro-	99.9	$\alpha$ -146.46 $\beta$ -141.54	7.15971	1185.48	254.264
CH <sub>2</sub> BrCl	Methane, bromochloro-	99.93	- 87.95	6.39587	895.556	186.703
C <sub>2</sub> Cl <sub>4</sub> O	Acetyl chloride, trichloro-	99.63	- 56.95	6.98442	1386.68	219.703
C <sub>2</sub> HCl <sub>3</sub> O <sub>2</sub>	Acetic acid, trichloro-	99.89	59.16	7.31057	1618.97	167.882
C <sub>2</sub> H <sub>2</sub> Cl <sub>2</sub> O	Acetyl chloride, chloro-	99.52	- 21.77	7.13411	1331.94	207.176
C <sub>2</sub> H <sub>3</sub> Cl	Ethylene, chloro-	99.86	-178.72 <sup>b</sup>	6.86108	892.757	238.099
C <sub>2</sub> H <sub>3</sub> ClO	Acetyl chloride	99.72	-112.86	6.84078	1062.86	217.619
C <sub>2</sub> H <sub>3</sub> ClO <sub>2</sub>	Acetic acid, chloro-	99.82	62.65	7.56597	1733.96	180.996
C <sub>2</sub> H <sub>4</sub> O	Ethylene oxide	99.8	-112.55	7.26100	1115.10	244.135
C <sub>2</sub> H <sub>4</sub> O <sub>2</sub>	Acetic acid	99.75	16.34	7.55716	1642.54	233.386
C <sub>2</sub> H <sub>7</sub> NO	Ethanol, 2-amino-	99.94	10.31	7.73800	1732.11	186.215
C <sub>3</sub> H <sub>6</sub> O	Propylene oxide	99.90	-112.13	6.96997	1065.27	226.283
C <sub>4</sub> H <sub>6</sub> O <sub>3</sub>	Acetic anhydride	99.75	- 74.13	7.12165	1427.77	198.037
C <sub>4</sub> H <sub>11</sub> NO <sub>2</sub>	Ethanol, 2,2'-iminodi-	99.9	27.95	8.13968	2328.56	174.399
C <sub>6</sub> HCl <sub>5</sub> O	Phenol, pentachloro-	99.73	189.65	9.073	3606.	273.15
C <sub>6</sub> H <sub>4</sub> Cl <sub>2</sub>	Benzene, 1,2-dichloro-	99.93	- 17.00	7.07028	1649.55	213.314
C <sub>6</sub> H <sub>4</sub> Cl <sub>2</sub>	Benzene, 1,4-dichloro-	99.90	52.99	6.99800	1575.11	208.513
C <sub>6</sub> H <sub>7</sub> N	Aniline	99.98	- 6.02	7.25375	1684.35	201.175
C <sub>6</sub> H <sub>15</sub> NO <sub>3</sub>	Ethanol, 2,2',2''-nitritoltri-	99.7	21.57	8.55499	2962.73	186.750
C <sub>6</sub> H <sub>6</sub> Cl <sub>2</sub> O <sub>2</sub>	Ethanol, 2-(2,4-dichlorophenoxy)	99.7 <sup>1</sup>	54 ± 2.5	7.27782	2035.22	160.371
C <sub>8</sub> H <sub>6</sub> Br	Benzene, 2-bromoethyl-	99.7	- 55.93	7.94437	2359.07	250.190
C <sub>9</sub> H <sub>19</sub> NO	2-Propanol, 1-cyclohexylamino-	99.90	45.60	7.07363	1700.13	167.429
C <sub>10</sub> H <sub>14</sub>	<i>o</i> -Cymene	99.94 <sup>1</sup>	...	7.41674	1880.47	236.272
C <sub>10</sub> H <sub>14</sub>	<i>m</i> -Cymene	99.92	- 63.94	7.31903	1784.78	227.233
C <sub>10</sub> H <sub>14</sub>	<i>p</i> -Cymene	99.96	- 67.98	7.03724	1599.29	207.659
C <sub>10</sub> H <sub>14</sub> O	Phenol, <i>o</i> - <i>tert</i> -butyl-	99.97	- 5.62	7.35275	1928.57	207.184
C <sub>12</sub> H <sub>18</sub>	Benzene, <i>p</i> -diisopropyl-	99.8	- 17.08	6.69270	1641.44	191.946
C <sub>14</sub> H <sub>14</sub> O <sub>2</sub>	Ethanol, 2-(2-biphenyloxy)-	99.8	73.	8.34282	3111.16	235.052
C <sub>14</sub> H <sub>22</sub> O	Phenol, <i>p</i> -(1,1,3,3-tetramethylbutyl)-	99.76	85.02	6.98313	1812.48	151.418

<sup>a</sup>Purity not determined by freezing point method. <sup>b</sup>M.p.

Table III. Calculated Vapor Pressures of Thirty Organic Compounds

Formula	Name	Pressure in Mm. Hg									
		1	5	10	20	40	60	100	200	400	760
CBrF <sub>3</sub>	Methane, bromotrifluoro	-143.74	-129.64	-122.62	-114.92	-106.42	-101.03	- 93.75	- 82.87	- 70.64	- 57.89
CBr <sub>2</sub> F <sub>2</sub>	Methane, dibromodifluoro	- 88.69	- 70.77	- 61.81	- 51.92	- 40.96	- 33.98	- 24.51	- 10.27	5.84	22.79
CH <sub>2</sub> BrCl	Methane, bromochloro-	- 46.68	- 29.50	- 20.73	- 10.93	0.11	7.24	17.02	32.00	49.35	68.07
C <sub>2</sub> Cl <sub>4</sub> O	Acetyl chloride, trichloro-	- 21.16	0.91	12.01	24.28	37.93	46.64	58.50	76.38	96.72	118.21
C <sub>2</sub> HCl <sub>3</sub> O <sub>2</sub>	Acetic acid, trichloro-	53.57	76.99	88.67	101.52	115.72	124.75	136.98	155.30	175.96	197.59
C <sub>2</sub> H <sub>2</sub> Cl <sub>2</sub> O	Acetyl chloride, chloro-	- 20.48	- 0.20	9.96	21.17	33.59	41.51	52.26	68.41	86.72	105.98
C <sub>2</sub> H <sub>3</sub> Cl	Ethylene, chloro-	-107.98	- 93.22	- 85.78	- 77.53	- 68.34	- 62.46	- 54.44	- 42.32	- 28.48	- 13.80
C <sub>2</sub> H <sub>3</sub> ClO	Acetyl chloride	- 62.25	- 44.57	- 35.65	- 25.76	- 14.73	- 7.68	1.94	16.50	33.13	50.78
C <sub>2</sub> H <sub>3</sub> ClO <sub>2</sub>	Acetic acid, chloro-	solid	71.51	83.09	95.78	109.75	118.59	130.53	148.34	168.32	189.10
C <sub>2</sub> H <sub>4</sub> O	Ethylene oxide	- 90.56	- 74.20	- 66.03	- 57.04	- 47.08	- 40.76	- 32.18	- 19.32	- 4.79	10.44
C <sub>2</sub> H <sub>4</sub> O <sub>2</sub>	Acetic acid	solid	solid	17.11	29.16	42.44	50.84	62.19	79.12	98.10	117.86
C <sub>2</sub> H <sub>7</sub> NO	Ethanol, 2-amino-	37.63	59.86	70.85	82.87	96.07	104.41	115.65	132.36	151.04	170.39
C <sub>3</sub> H <sub>6</sub> O	Propylene oxide	- 73.45	- 56.41	- 47.84	- 38.37	- 27.83	- 21.10	- 11.94	1.88	17.60	34.23
C <sub>4</sub> H <sub>6</sub> O <sub>3</sub>	Acetic anhydride	2.45	24.26	31.20	47.26	60.64	69.16	80.73	98.14	117.87	138.63
C <sub>4</sub> H <sub>11</sub> NO <sub>2</sub>	Ethanol, 2,2'-iminodi-	111.68	138.55	151.74	166.10	181.78	191.64	204.86	224.42	246.10	268.39
C <sub>6</sub> HCl <sub>5</sub> O	Phenol, pentachloro-	solid	solid	solid	190.8	209.5	221.1	236.7*	259.3*	284.1*	309.2*
C <sub>6</sub> H <sub>4</sub> Cl <sub>2</sub>	Benzene, 1,2-dichloro-	19.99	45.59	58.43	72.61	88.35	98.38	112.02	132.56	155.86	180.42
C <sub>6</sub> H <sub>4</sub> Cl <sub>2</sub>	Benzene, 1,4-dichloro-	solid	solid	solid	67.97	83.39	93.24	106.64	126.83	149.80	174.06
C <sub>6</sub> H <sub>7</sub> N	Aniline	31.03	55.79	68.16	81.78	96.85	106.44	119.43	138.91	160.92	184.00
C <sub>6</sub> H <sub>15</sub> NO <sub>3</sub>	Ethanol, 2,2',2''-nitritoltri-	159.56	190.37	205.41	221.68	239.36	250.44	265.23	286.99	310.94	335.39
C <sub>8</sub> H <sub>6</sub> Cl <sub>2</sub> O <sub>2</sub>	Ethanol, 2-(2,4-dichloro- phenoxy)-	119.28	148.99	163.82	180.15	198.21	209.69	225.25	248.57	274.90	302.49
C <sub>8</sub> H <sub>6</sub> Br	Benzene, 2-bromoethyl-	46.76	75.40	89.52	104.91	121.77	132.39	146.67	167.84	191.39	215.70
C <sub>9</sub> H <sub>19</sub> NO	2-Propanol, 1-cyclohexylamino-	72.92	99.27	112.49	127.09	143.29	153.62	167.66	188.80	212.78	238.06
C <sub>10</sub> H <sub>14</sub>	<i>o</i> -Cymene	17.27	43.65	56.79	71.21	87.13	97.23	110.89	131.32	154.30	178.30
C <sub>10</sub> H <sub>14</sub>	<i>m</i> -Cymene	16.62	42.37	55.21	69.34	84.96	94.88	108.31	128.44	151.14	174.91
C <sub>10</sub> H <sub>14</sub>	<i>p</i> -Cymene	19.60	44.66	57.24	71.15	86.59	96.44	109.83	130.01	152.93	177.12
C <sub>10</sub> H <sub>14</sub> O	Phenol, <i>o</i> - <i>tert</i> -butyl	55.11	82.66	96.40	111.50	128.18	138.77	153.11	174.58	198.77	224.08
C <sub>12</sub> H <sub>18</sub>	Benzene, <i>p</i> -diisopropyl-	43.80	70.11	83.34	97.98	114.26	124.66	138.81	160.17	184.48	210.18
C <sub>14</sub> H <sub>14</sub> O <sub>2</sub>	Ethanol, 2-(2-biphenyloxy)-	137.86	171.96	188.65	206.76	226.49	238.87	255.45	279.89	306.89	334.55
C <sub>14</sub> H <sub>22</sub> O	Phenol, <i>p</i> -(1,1,3,3-tetramethyl- butyl)-	108.13	137.00	151.1	167.56	185.41	196.80	212.31	235.69	262.29	290.40

\*Decomposes.