

TABLE VIII. ORGANIC DERIVATIVES OF ETHERS
a) Liquids (Listed in order of increasing atmospheric b.p.)*

No	Name	Boiling point, °C	Melting point °C	n_D^{20}	D_4^{20}	Picrate	Sulfon amide	Nitro derivative	Bromo derivative	1,3,5-Tri-nitro-benzene addition compound	3,5-Dinitro benzoate	Miscellaneous
1	Ethylene oxide (Epoxyethane)	10.7	-111.7	1.3614 ⁴	0.89713 ⁹							HBr → Ethylene bromohydrin, b p 149
2	Ethyl methyl ether	10.8, 10.31			0.7260 ⁹							Maleic anhydride → 3,6-Endoxo- Δ^4 -tetrahydrophthalic anhydride, 125d, 118d, abs eth Iodide, b p 72
3	Furan	31.27	-85.6	1.42157	0.9366						93	
4	Diethyl ether (Ethyl ether)	34.60	-116.3, stab, -123.3, unst	1.3526	0.71352							
5	Propylene oxide (1,2-Epoxypropane)	35		1.466	0.830							Heating with dil H_2SO_4 → <i>d</i> -propylene glycol, b p 187.4
6	Ethyl vinyl ether	35.75	-115.8	1.3768	0.7589							Dil acid → al + acetaldehyde
7	Methyl <i>n</i> -propyl ether	39		1.3579	0.7356 ⁴							
8	Allyl methyl ether	46							β, γ -di b p 185, D_4^{20} 1.8329			
9	Ethyl isopropyl ether	53.4			0.7211 (0.745 ⁹)							Heating with 1% H_2SO_4 (sealed tube) → al + isopropyl alcohol
10	<i>tert</i> -Butyl methyl ether	55.2		1.3689	0.7405							Constant boil mixt with w, b p 52.6, with 4% w
11	2,3-Epoxybutane	<i>cis</i> 58.9 ⁷⁴⁵ <i>trans</i> 53-4 ⁷⁴¹			<i>cis</i> 0.8226 ²⁵ , <i>trans</i> 0.8010 ²⁵							Normal crude mixt is 65% <i>trans</i> + 35% <i>cis</i>
12	Chloromethyl methyl ether	59		1.3974	1.015	163						
13	α -Butylene oxide (1,2-Epoxybutane)	61-2		1.385 ¹⁷	0.837 ¹⁷							
14	Ethyl <i>n</i> -propyl ether	63.6	< -79	1.36948	0.7386							Constant boil mixt with al, b p 61.2, with 25% al
15	2-Methylfuran (Sylvan)	64		1.434	0.913							
16	Tetrahydrofuran	65		1.407	0.889							
17	Allyl ethyl ether	66-7 ⁷⁴²		1.3881	0.7651				β, γ -di b p 193-5			Heating with 2% H_2SO_4 → al + allyl alcohol
18	Di-isopropyl ether (Isopropyl ether)	67.5	-60	1.3688	0.726						123, 120-1, CCl_4	

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19	<i>n</i> -Butyl methyl ether	70	-115.5	1.3728, 1.3736	0.7455, 0.7474							Oxid by alkaline KMnO ₄ at 35-40° → ac a + methoxyacetic acid
20	<i>tert</i> -Butyl ethyl ether	73.1 (cor)		1.3760	0.7404							Constant boil mixt with w, b p 65.2, with 6% w
21	Tetrahydrofuran	79		1.407	0.855							
22	Chloromethyl ethyl ether	80, 83d		1.40398	1.014							
23	Ethyl isobutyl ether	81.1 (cor)		1.3739 ²⁵	0.7323 ²⁵							
24	<i>sec</i> -Butyl ethyl ether	81.2 (cor)		1.3802	0.7503							
25	Isopropyl <i>n</i> -propyl ether	83		1.376	0.7370							
26	Ethylene glycol dimethyl ether	84.7		1.37965	0.8665							
27	Dihdropyran	86		1.440	0.923							
28	<i>tert</i> -Amyl methyl ether	86.3		1.3885	0.7703							Constant boil mixt with w, b p 73.8, with 9% w. Constant boil mixt with me al, b p 62.3, with 50% me al
29	Tetrahydropyran	88		1.421	0.881							
30	Di- <i>n</i> -propyl ether (<i>n</i> -Propyl ether)	90.1	-122	1.38829	0.74698						74	Constant boil mixt with w, b p 75.4, Constant boil mixt with <i>n</i> -propyl alcohol, b p 85.8
31	<i>n</i> -Butyl ethyl ether	92.3 (cor)	-124	1.3820	0.7505							
32	2,5-Dimethylfuran	94		1.4363 ^{21,6}	0.888 ^{20,1}				<i>penta</i> 180, chl			Maleic anhydride → 3,6-Endoxo-3,6-dimethyl- Δ^4 -tetrahydrophthalic anhydride, 78, eth
33	α -Chloroethyl ethyl ether	98		1.404	0.966							
34	<i>n</i> -Amyl methyl ether	99-100		1.3873	0.761							
35	<i>tert</i> -Amyl ethyl ether	101		1.3912	0.7657							Constant boil mixt with 13% w, b p 81.2
36	1,4-Dioxane	101.4	11.8	1.4232	1.03361					65-6		Iodine derivative, 84.5, Constant boil mixt with 48 mole% dioxane, b p 82.8

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37	Ethylene glycol monoethyl monomethyl ether (1-Ethoxy-2-methoxyethane)	102		1.38677	0.8529							
38	Cyclopentyl methyl ether	105		1.4206	0.862							
39	β -Chloroethyl ethyl ether	107		1.411	0.989							
40	<i>n</i> -Butyl isopropyl ether	108 ⁷³⁸		1.3889 ₄₆₁ ⁴¹	0.7594 ¹⁵							Boil HI → <i>n</i> -butyl iodide + isopropyl iodide
41	α -Epichlorohydrin	115.7		1.438	1.181							
42	α, α' -Dichloroethyl ether	116, 114		1.4183 ²⁴	1.138 ₁ ²							
43	<i>n</i> -Amyl ethyl ether	118		1.3927	0.762							
44	Di- <i>sec</i> -butyl ether	121		1.3928 ²⁷	0.760					b p 90.1 n_D^{25} 1.250	75.5	
45	Cyclopentyl ethyl ether	122		1.423	0.853							
46	Di-isobutyl ether (Isobutyl ether)	123			0.7616 ₁₅						87, 84.5 5.5	
47	Ethylene glycol mono-methyl mono- <i>n</i> -propyl ether (1-Methoxy 2- <i>n</i> propoxyethane)	124.5		1.39467	0.8472							
48	<i>n</i> -Hexyl methyl ether	126		1.3972	0.772							
49	2-Methoxy-1-propanol	130 ⁷⁵⁸									97	α -Naphthylurethane, 60
50	Cyclohexyl methyl ether	134		1.435	0.875							
51	Ethylene glycol monoethyl ether ("Cello-solve", 2-Ethoxy-ethanol)	134.8, 135.1		1.40797	0.9297 0.9311						75	Miscible with w, with al and with eth, Diphenylurethane, 43, Xanthate, 202.5 (cor), acet abs eth Phenylurethane, 226
52	3-Ethoxy-2-methyl-2-butanol	141										
53	<i>n</i> -Hexyl ethyl ether	142		1.4008	0.772							
54	Di- <i>n</i> -butyl ether (Butyl ether)	142.4, 144	-98	1.3989	0.76829						62.3, 64	
55	Cyclohexyl ethyl ether	149		1.435	0.864							
56	Anisole (Methoxybenzene, Methyl phenyl ether)	153.8, 155 (43 ¹⁰)	-37.5	1.52211	0.99393	79.81, unst in air	113, 110.1, al	2,4- <i>di</i> 86.9, al, 95.5	2,4- <i>di</i> 61, al		87	
57	3-Methoxy-2-methyl-1-propanol	155		1.4140 ²⁷							64	
58	Diethylene glycol dimethyl ether	162.0	-75	1.4099	0.9440 ₃₀							

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59	Furfuryl alcohol (2-Furancarbinol)	170		1.4868	1.1351						80-1, pyr	<i>p</i> -Nitrobenzoate, 76, N-Phenylurethane, 45
60	Ethylene glycol mono- <i>n</i> -butyl ether (<i>n</i> -Butyl "cellosolve")	171 ⁷⁴³		1.4177	0.9188				172		oil	3-Nitrophthalate, 120
61	Benzyl methyl ether	170-1 (cor)		1.5008	0.9649	115.6						
62	2-Methoxytoluene (2-Methyl anisole, Methyl 2-tolyl ether, 2-Cresyl methyl ether)	171		1.505	0.9853	116, 113.4, pale yellow	137, al	3,5-di 69, pale yellow, me al	5-mono 63-4, al			Oxid → <i>o</i> -Methoxybenzoic acid, 101
63	Phenyl ethyl ether (Phenetole)	172	-33	1.5080, 1.5074	0.9666	92	150	<i>p</i> -mono 58				
64	Di-isoamyl ether (Isoamyl ether)	172.5		1.409	0.778						60.1	Constant boil mixt with w, b p 97.2
65	4-Methoxytoluene (4-Methylanisole, Methyl 4-tolyl ether, 4-Cresyl methyl ether)	173, 176		1.512	0.970	88-9, yellow-orange	182, al					Oxid → <i>p</i> -Anisic acid, 184-6, 184, w
66	3-Methoxytoluene (3-Methylanisole, Methyl 3-tolyl ether, 3-Cresyl methyl ether)	173, 177 (cor)		1.513	0.972	113.4, yellow-orange	129.30, al	2-mono 54-5, petroleum, 2,4,6-tri 92, al				Oxid → <i>m</i> -Methoxybenzoic acid, 110
67	Tetrahydrofurfuryl alcohol	117		1.45167	1.0544						83-4	<i>p</i> -Nitrobenzoate, 46-8, N-Phenylurethane, 61, petroleum conc H ₂ SO ₄ + ac a → <i>o</i> -Isopropylphenol, b p 213-4, m p 130
68	Phenyl isopropyl ether	178		1.4992	0.975							
69	β, β' -Dichloroethyl ether	178		1.4568	1.220							
70	2-Ethoxytoluene (2-Cresyl ethyl ether, Ethyl 2-tolyl ether)	184		1.505	0.953	117.5, 85, pale yellow	148-9, al	<i>di</i> 51				Oxid → <i>o</i> -Ethoxybenzoic acid, 25, 190-5, well dried
71	Benzyl ethyl ether (Homophenetole)	184-6 (cor)		1.4958	0.9478							Refluxed in benz + P ₂ O ₅ → Ethylene + Diphenylmethane, 25.1
72	Di- <i>n</i> -amyl ether (<i>n</i> -Amyl ether)	187.5	-69.3	1.416	0.78298						42.3	
73	Diethylene glycol diethyl ether	188		1.411	0.906							
74	Phenyl <i>n</i> -propyl ether (<i>n</i> -Propoxybenzene)	188, 189.3 (cor)		1.5014, 1.5011	0.9494 ⁸⁸		116.7, al					

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75	4-Ethoxytoluene (4-Cresyl ethyl ether Ethyl 4-tolyl ether)	190.5		1.505	0.949	110.1, or yel	138.05, al					Oxid → <i>p</i> -Ethoxybenzoic acid, 198, 195.0-5, al
76	3-Ethoxytoluene (3-Cresyl ethyl ether Ethyl 3-tolyl ether)	190.5		1.506	0.949	114.5 or -yel	110.1 al					Oxid → <i>m</i> -Ethoxybenzoic acid, 137
77	Diethylene glycol monomethyl ether	194		1.4244	1.035 ₄ ²⁰							<i>p</i> -Nitrophenylurethane, 73.5
78	3-Chloroanisole	194					131					
79	2-Chloroanisole	195		1.5433 ²⁵	1.1865 ₄ ¹⁵			95				
80	Diethylene glycol monoethyl ether	196		1.4298	1.023 ₄ ²⁰						oil	<i>p</i> -Nitrophenylurethane, 66
81	4-Chloroanisole	200			1.1851 ₄ ²⁰ *		151	2-mono 95				
82	<i>n</i> -Butyl phenyl ether (<i>n</i> -Butoxybenzene)	206		1.5049		110-2, pa yel chl	103.4, al					
83	2-Chlorophenetole	208	17				133	82				
84	2-Bromoanisole	210					140	106				
85	Benzyl isobutyl ether (cor)	210.2		1.4826	0.9233							
86	<i>p</i> -Bromoanisole	215, 216			1.494 ₄ ⁰		148	88				
87	Methyl thymyl ether	216			0.954 ₄ ⁰			<i>tri</i> 92				
88	Triethylene glycol dimethyl ether	216	-47	1.4233	0.9871 ₄ ²⁰							
89	1,3-Dimethoxybenzene (Resorcinol dimethyl ether)	217 (cor)	-58, -52	1.4233	1.0552 ₄ ²⁵	56.8, or -yel, unst in air	166-7, al	2,4- <i>di</i> 72, pa yel, al, 4,6- <i>di</i> 157 al, 2,4,6- <i>tri</i> 123-4, pa red, al	4,6- <i>di</i> 140, al			
90	2-Bromophenetole	218					135	98				
91	Benzyl <i>n</i> -butyl ether (cor)	219-21		1.4833	0.9227							
92	Creosol (4-Methylcatechol 2-methyl ether)	221	5.5	1.5353 ²⁵	1.0919 ₄ ²⁵	112, yel						
93	<i>n</i> -Butyl 2-tolyl ether (2-Butoxytoluene)	223			0.9437 ₆ ⁰		95-6, al					
94	2-Methoxyaniline (2-Anisidine)	225	5		1.0978 ₁₅ ¹⁵							
95	Di- <i>n</i> -hexyl ether (<i>n</i> -Hexyl ether)	228-9 ⁷⁶¹			0.7936						54.5-5.5	N-Formyl, 83.5, N-Acetyl, 87-8
96	Safrole (4-Allyl-1,2-methylenedioxybenzene)	233	11	1.5383	1.100	104.05.5, or -red			<i>tri</i> 108, <i>penta</i> 169-70, bz	51		
97	4-Bromophenetole	233, 229	12				145	47				

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98	Resorcinol diethyl ether	235	12.4			109	184		<i>tri</i> 69			
99	Eugenol methyl ether (4-Allyl-1,2-dimethoxybenzene)	244		1.5360	1.0336	114.5, red-br, chl	7		<i>tri</i> 78, abs al			
100	2-Iodophenetole	246			1.800	84			<i>tri</i> 110			
101	trans(β)-Isosafrole (1,2-Methylene-dioxy-4-propylbenzene)	248	6.8	1.5782	1.122	74.5, dk red, chl			<i>di</i> 52-3, eth, <i>tri</i> 109, 10, pet eth	85.6, brt scar		
102	3-Methoxyaniline (3-Anisidine)	251				169d, yel						N-Formyl, 57, N-Acetyl, 81, N-p-Toluenesulfonyl, 68
103	Di-n-heptyl ether (n-Heptyl ether)	263, 260		1.427	0.8056 ₃₀						47	
104	Isoeugenol methyl ether	264	16-7	1.5692	1.0528	42.5, dk red, chl			<i>di</i> 101.0, 5, abs eth	69-70, brt scar		Oxid → Veratric acid, 181
105	Tetraethylene glycol dimethyl ether	266, 275		1.432	1.009							
106	Methyl 1-naphthyl ether (1-Methoxynaphthalene)	271 (cor)	< -10	1.6940 ²⁵	1.09159	129.5, 30.5, yel-or, chl	156.7, al	2-mono 80,4 mono 85, yel, al	4-mono b p 181-2, 5-mono 67.5, 80, x-mono 46, al, 2,4-di 54.5, al	139.40, 137.8, yel		
107	2-Nitroanisole	277	10	1.562	1.254							Reduct → o-anisidine, b p 225
108	Ethyl 1-naphthyl ether (1-Ethoxynaphthalene)	280.5 (cor)	5.5	1.5973 ²⁵	1.074	118.5, 9.0 (cor)	164-5, al	2-mono 84,4-mono 116-7, al	4-mono 48, al	125.5, yel		
109	Dibenzyl ether (Benzyl ether)	290, 300d	3.6		1.0428	77.8, or-yel, chl			<i>di</i> 107-8, al		112	
110	Isoamyl 1-naphthyl ether	317.5 (cor)	< -10	1.57049 ^{14,2}	1.00689 ^{14,2}	96.0-7.0						

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