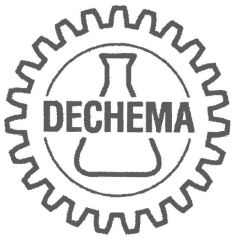
J. Gmehling
U. Onken

VAPOR-LIQUID EQUILIBRIUM DATA COLLECTION

Alcohols: Supplement 7
2-Propyn-1-ol
2-Propen-1-ol
2,3-Epoxy-1-propanol
1-Propanol
2-Propanol
1,2-Propanediol



Chemistry Data Series

Vol I, Part 2i

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Executive Editor: Gerhard Kreysa

Vapor-Liquid Equilibrium Data Collection

2i

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Tables and diagrams of data for binary and multicomponent mixtures up to moderate pressures. Constants of correlation equations for computer use.

J. Gmehling, U. Onken

Technische Chemie
Universität Oldenburg

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SUBJECTS OF VOLUME I

The subjects of Volume I in the Chemistry Data Series (CDS) are:

Subtitle	Vol. I, Part
Aqueous Systems	1
	1 a
	1 b
	1 c/d
Organic Hydroxy Compounds	
Alcohols	2 a
Alcohols and Phenols	2 b
	2 c
	2 d
	2 e
	2 f
Alcohols	2 g
	2 h
	2 i
Aldehydes, Ketones, Ethers	3/4
Aldehydes	3 a
	3 c
Ketones	3 b
	3 c
Ethers	4 a
	4 b
Carboxylic Acids, Anhydrides, Esters	5
Carboxylic Acids, Anhydrides	5 a
Esters	5 b
Aliphatic Hydrocarbons C_4-C_6	6 a
Aliphatic Hydrocarbons C_7-C_{18}	6 b
	6 c
Aliphatic Hydrocarbons C_4-C_{30}	6 d/e
Aromatic Hydrocarbons	7
	7 a/b
Halogen, Nitrogen, Sulfur and other compounds	8
	8 a

AUTHOR'S PREFACE

With this volume the seventh supplement of the part "alcohols" of our Vapor-Liquid Equilibrium Data Collection has been finished. Basis of our data collection is the Dortmund Data Bank (DDB) which is continuously updated by DDBST GmbH (www.ddbst.de) under the responsibility of Dipl.-Chem. J. Krafczyk and Dipl.-Chem. J. Menke. Thanks to the diligent work by them and by the other members of the DDBST team it has been possible to keep the Dortmund Data Bank up-to-date.

Our special gratitude goes to Dr. R. Sass (DECHEMA e. V.) for his part in editing the data collection for many years.

Oldenburg and Dortmund, December 2007

J. Gmehling U. Onken

EXECUTIVE EDITOR'S PREFACE

DECHEMA e. V. Society for Chemical Engineering and Biotechnology was founded in 1926 with the aim of improving cooperation between chemists and engineers. One concrete implementation of this aim was the publication in the mid-1970s of collections of basic thermophysical data in electronic and book form in response to the increasing importance of mathematical modelling, computer simulation and optimization. On account of its sheer volume and limited circle of interest, this was not the sort of material that publishers rush to publish. DECHEMA leapt into the breach and has since sponsored and published the DECHEMA Chemistry Data Series for well over a quarter of a century. Much of the original work to determine the values obtained was financed by the German Federal Ministry of Research and Technology.

We hope that the publication of this collection of data in the DECHEMA Chemistry Data Series will encourage other authors to publish their own collections of thermophysical data and it goes without saying that we would be happy to pass on the experience we have accumulated over the years.

Finally, no new edition would be complete without a word of thanks to our readers – scientists and engineers from the thermophysical data community – for their constructive suggestions and input which have contributed to its success. We are confident that you will find this new edition of the DECHEMA Chemistry Data Series not only useful, but also interesting and inspiring.

Frankfurt am Main, December 2007 Gerhard Kreysa

CONTENTS
Vol. I, Part 2i

In Part 2i:

Part 2i contains pages I–XXIII and 1–715.

C_3H_4O	2-Propyn-1-ol	C_2HCl_3	Trichlorethylene	1–3
		$C_2H_2Cl_4$	1,1,2,2-Tetrachloroethane	4–6
		$C_2H_3Cl_3$	1,1,1-Trichloroethane [R140A]	7–9
		$C_2H_4Cl_2$	1,2-Dichloroethane	10–12
		C_2H_6OS	Dimethyl sulfoxide	13
C_3H_6O	2-Propen-1-ol	CH_2O	Formaldehyde	14–16
		C_2Cl_4	Tetrachloroethylene	17, 18
		C_2HCl_3	Trichloroethylene	19–21
		$C_2H_2Cl_4$	1,1,2,2-Tetrachloroethane	22–24
		$C_2H_3Cl_3$	1,1,1-Trichloroethane [R140A]	25–27
		C_2H_3N	Acetonitrile	28–33
		$C_2H_4Cl_2$	1,2-Dichloroethane	34–36
		C_3H_6O	Acetone	37
		$C_3H_6O_2$	2,3-Epoxy-1-propanol	38
		C_3H_8O	1-Propanol	39–42
		C_6H_6	Benzene	43–45
		C_6H_{12}	Cyclohexane	46–49
		C_6H_{14}	Hexane	50, 51
		$C_6H_{18}OSi_2$	Hexamethyl disiloxane	52
$C_3H_6O_2$	2,3-Epoxy-1-propanol	C_3H_5ClO	Epichlorohydrin	53, 54
C_3H_8O	1-Propanol	CCl_4	Tetrachloromethane	55–57
		$CHCl_3$	Chloroform	58
		CH_2BrCl	Bromochloromethane [R30B1]	59
		CH_2Br_2	Dibromoethane [R30B2]	60
		CH_2O	Formaldehyde	61
		CH_3NO_2	Nitromethane	62, 63
		C_2Cl_4	Tetrachloroethylene	64, 65
		C_2HCl_3	Trichloroethylene	66–69
		$C_2H_3Cl_3$	1,1,1-Trichloroethane [R140A]	70–72
		$C_2H_3F_3O$	2,2,2-Trifluoroethanol	73
		C_2H_3N	Acetonitrile	74–76
		C_2H_4BrCl	1-Bromo-2-chloroethane	77
		$C_2H_4Cl_2$	1,2-Dichloroethane	78–82
		$C_2H_4O_2$	Acetic acid	83
		$C_2H_5NO_2$	Nitroethane	84
		C_2H_6O	Dimethyl ether	85

C_3H_8O	1-Propanol	C_2H_6OS	Dimethyl sulfoxide	86
		C_3H_5N	Propionitrile	87
		C_3H_6O	Acetone	88–97
		C_3H_6O	Propanal	98
		$C_3H_6O_2$	Formic acid ethyl ester	99
		$C_3H_6O_2$	Methyl acetate	100–103
		$C_3H_6O_3$	Carbonic acid dimethyl ester	104–107
		C_3H_7NO	N,N-Dimethylformamide (DMF)	108–115
		C_3H_7NS	N,N-Dimethylthioformamide	116
		C_3H_8O	2-Propanol	117–124
		$C_3H_8O_2$	2-Methoxyethanol	125, 126
		C_3H_9NO	3-Amino-1-propanol	127–129
		C_4H_7N	Butanenitrile	130–138
		C_4H_8O	2-Butanone	139–145
		C_4H_8O	Butyraldehyde	146, 147
		C_4H_8O	Tetrahydrofuran	148, 149
		$C_4H_8O_2$	1,4-Dioxane	150
		$C_4H_8O_2$	Ethyl acetate	151
		$C_4H_8O_2$	Formic acid propyl ester	152, 153
		$C_4H_8O_2$	Methyl propanoate	154–158
		$C_4H_{10}O$	1-Butanol	159–163
		$C_4H_{10}O$	2-Butanol	164
		$C_4H_{10}O$	tert-Butanol	165
		$C_4H_{10}O$	Diethyl ether	166
		$C_4H_{10}O$	2-Methyl-1-propanol	167–173
		$C_4H_{10}O_2$	2-Ethoxyethanol	174
		$C_5H_3F_9O$	1,1,2,3,3,3-Hexafluoropropyl-2,2,2-trifluoroethyl ether	175
		$C_5H_4O_2$	Furfural	176
		$C_5H_8O_2$	2,4-Pentanedione	177
		C_5H_9NO	N-Methyl-2-pyrrolidone	178
		$C_5H_{10}O$	3-Pentanone	179, 180
		$C_5H_{10}O_2$	Acetic acid propyl ester	181–194
		$C_5H_{10}O_2$	Formic acid butyl ester	195
		$C_5H_{10}O_2$	Methyl butanoate	196–202
		$C_5H_{10}O_2$	Propanoic acid ethyl ester	203
		$C_5H_{10}O_3$	Carbonic acid diethyl ester	204

C_3H_8O	1-Propanol	C_5H_{12}	Pentane	205–207
		$C_5H_{12}N_2$	1-Methylpiperazine	208
		$C_5H_{12}O$	2-Methyl-1-butanol	209
		$C_5H_{12}O$	3-Methyl-1-butanol	210, 211
		$C_5H_{12}O$	Methyl tert-butyl ether (MTBE)	212–216
		$C_5H_{12}O$	1-Pentanol	217–219
		$C_5H_{12}O$	2-Pentanol	220
		$C_5H_{13}N$	1-Aminopentane	221
		C_6H_5Cl	Chlorobenzene	222–227
		$C_6H_5NO_2$	Nitrobenzene	228
		C_6H_6	Benzene	229–239
		C_6H_6O	Phenol	240–242
		C_6H_{12}	Cyclohexane	243–252
		$C_6H_{12}O_2$	Acetic acid butyl ester	253, 254
		$C_6H_{12}O_2$	Ethyl butyrate	255, 256
		$C_6H_{12}O_2$	Propanoic acid propyl ester	257
		$C_6H_{13}N$	Cyclohexylamine	258
		C_6H_{14}	Hexane	259–263
		$C_6H_{14}O$	Diisopropyl ether	264–266
		$C_6H_{14}O$	Di-n-propyl ether	267–274
		$C_6H_{14}O$	Ethyl tert-butyl ether (ETBE)	275
		$C_6H_{14}O$	Methyl tert-amyl ether (TAME)	276–278
		$C_6H_{14}O$	4-Methyl-1-pentanol	279
		$C_6H_{15}N$	Dipropylamine	280–285
		$C_6H_{18}OSi_2$	Hexamethyl disiloxane	286–288
		C_7H_8	Toluene	289, 290
		C_7H_8O	2-Methylphenol	291
		C_7H_8O	4-Methylphenol	292
		C_7H_8O	Methyl phenyl ether	293, 294
		C_7H_{14}	Methylcyclohexane	295–297
		$C_7H_{14}O$	2,4-Dimethyl-3-pentanone	298
		$C_7H_{14}O_2$	Butanoic acid propyl ester	299, 300
		$C_7H_{14}O_2$	Propanoic acid butyl ester	301, 302
		C_7H_{16}	Heptane	303–315
		$C_7H_{16}O$	2,4-Dimethyl-3-pentanol	316, 317
		$C_8H_8O_3$	4-Hydroxy-3-methoxybenzaldehyde	318
		C_8H_{10}	Ethylbenzene	319, 320

C_3H_8O	1-Propanol	C_8H_{10}	m-Xylene	321–324
		C_8H_{10}	o-Xylene	325, 326
		C_8H_{10}	p-Xylene	327–329
		C_8H_{14}	1-Octyne	330–335
		$C_8H_{16}O_2$	1-Butanoic acid butyl ester	336
		C_8H_{18}	Octane	337–342
		C_8H_{18}	2,2,4-Trimethylpentane	343–345
		$C_8H_{20}O_4Si$	Tetraethoxysilane	346
		$C_9H_6O_2$	Coumarin	347
		C_9H_{12}	1,3,5-Trimethylbenzene	348–351
		C_9H_{16}	1-Nonyne	352–356
		$C_{10}H_{16}O$	3,7-Dimethyl-6-octen-1-yn-3-ol	357
		$C_{10}H_{18}O$	Linalool	358–362
		$C_{14}H_{10}$	Diphenylacetylene	363
C_3H_8O	2-Propanol	CCl_4	Tetrachloromethane	364–366
		$CHCl_3$	Chloroform	367
		CH_2Cl_2	Dichloromethane	368
		C_2Cl_4	Tetrachloroethylene	369–372
		$C_2Cl_4F_2$	1,1,2,2-Tetrachloro-1,2-difluoroethane [R112]	373, 374
		C_2HCl_3	Trichloroethylene	375–378
		$C_2H_2Cl_4$	1,1,2,2-Tetrachloroethane	379
		$C_2H_3Cl_3$	1,1,1-Trichloroethane [R140A]	380, 381
		C_2H_3N	Acetonitrile	382–385
		C_2H_4O	Acetaldehyde	386–391
		$C_2H_4O_2$	Methyl formate	392
		$C_2H_5NO_2$	Nitroethane	393
		$C_2H_8N_2$	Ethylenediamine	394
		C_3H_3N	Acrylonitrile	395
		C_3H_5ClO	Epichlorohydrin	396–400
		C_3H_5N	Propionitrile	401
		C_3H_6O	Acetone	402–405
		C_3H_6O	1,2-Propylene oxide	406, 407
		$C_3H_6O_2$	Formic acid ethyl ester	408, 409
		$C_3H_6O_2$	Methyl acetate	410–416
		$C_3H_6O_3$	Carbonic acid dimethyl ester	417–419
		C_3H_7Br	Propyl bromide	420, 421

C_3H_8O	2-Propanol	C_6H_6O	Phenol	550–552
		C_6H_{12}	Cyclohexane	553–559
		C_6H_{12}	2,3-Dimethyl-2-butene	560
		C_6H_{12}	Cyclohexane	561
		C_6H_{12}	1-Hexene	562
		$C_6H_{12}O$	4-Methyl-2-pentanone	563–565
		$C_6H_{12}O_2$	Acetic acid butyl ester	566
		$C_6H_{12}O_2$	Ethyl butyrate	567, 568
		$C_6H_{12}O_2$	Propanoic acid propyl ester	569
		$C_6H_{13}N$	Cyclohexylamine	570
		C_6H_{14}	Hexane	571–574
		$C_6H_{14}O$	Diisopropyl ether	575–579
		$C_6H_{14}O$	Di-n-propyl ether	580–587
		$C_6H_{14}O$	Ethyl tert-butyl ether (ETBE)	588–592
		$C_6H_{14}O_2$	1,1-Diethoxyethane	593, 594
		$C_6H_{15}N$	Dipropylamine	595
		C_7H_8	Toluene	596, 597
		C_7H_8O	2-Methylphenol	598
		C_7H_8O	4-Methylphenol	599
		C_7H_{14}	Methylcyclohexane	600, 601
		$C_7H_{14}O_2$	Butanoic acid propyl ester	602
		$C_7H_{14}O_2$	Propanoic acid butyl ester	603
		C_7H_{16}	Heptane	604–609
		$C_7H_{16}O$	Isopropyl tert-butyl ether	610, 611
		C_8H_{10}	Ethylbenzene	612
		C_8H_{10}	m-Xylene	613–615
		C_8H_{10}	o-Xylene	616, 617
		C_8H_{10}	p-Xylene	618, 619
		C_8H_{14}	1,7-Octadiene	620
		C_8H_{16}	1-Octene	621
		$C_8H_{16}O_2$	1-Butanoic acid butyl ester	622
		C_8H_{18}	Octane	623–626
		C_8H_{18}	2,2,4-Trimethylpentane	627–631
		$C_8H_{18}O_5$	Tetraethylene glycol	632
		$C_8H_{20}O_4Si$	Tetraethoxysilane	633
		C_9H_{12}	Isopropylbenzene	634–636
		C_9H_{12}	1,3,5-Trimethylbenzene	637–640

C_3H_8O	2-Propanol	$C_{10}H_{18}$	Decalin (Isomer not specified)	641
		$C_{10}H_{22}$	Decane	642
		$C_{13}H_{20}O$	6,10-Dimethyl-3,5,9-undecatrien-2-one	643
$C_3H_8O_2$	1,2-Propanediol	$C_4H_8O_2$	Ethyl acetate	644

Acetaldehyde	C_2H_4O	2-Propanol	C_3H_8O	386–391
Acetic acid	$C_2H_4O_2$	1-Propanol	C_3H_8O	83, 84
Acetic acid butyl ester	$C_6H_{12}O_2$	1-Propanol	C_3H_8O	253, 254
		2-Propanol	C_3H_8O	566
Acetic acid isopropyl ester	$C_5H_{10}O_2$	2-Propanol	C_3H_8O	514–518
Acetic acid propyl ester	$C_5H_{10}O_2$	1-Propanol	C_3H_8O	181–194
		2-Propanol	C_3H_8O	519, 520
Acetic anhydride	$C_4H_6O_3$	2-Propanol	C_3H_8O	428
Acetone	C_3H_6O	1-Propanol	C_3H_8O	88–97
		2-Propanol	C_3H_8O	402–405
		2-Propen-1-ol	C_3H_6O	37
Acetonitrile	C_2H_3N	1-Propanol	C_3H_8O	74–76
		2-Propanol	C_3H_8O	382–385
		2-Propen-1-ol	C_3H_6O	28–33
Acrylonitrile	C_3H_3N	2-Propanol	C_3H_8O	395
1-Aminopentane	$C_5H_{13}N$	1-Propanol	C_3H_8O	221
3-Amino-1-propanol	C_3H_9NO	1-Propanol	C_3H_8O	127–129
Benzene	C_6H_6	1-Propanol	C_3H_8O	229–239
		2-Propanol	C_3H_8O	542–549
		2-Propen-1-ol	C_3H_6O	43–45
1-Bromo-2-chloroethane	C_2H_4BrCl	1-Propanol	C_3H_8O	77
Bromochloromethane [R30B1]	CH_2BrCl	1-Propanol	C_3H_8O	59
Butanenitrile	C_4H_7N	1-Propanol	C_3H_8O	130–138
		2-Propanol	C_3H_8O	429–437
1-Butanoic acid butyl ester	$C_8H_{16}O_2$	1-Propanol	C_3H_8O	336
		2-Propanol	C_3H_8O	622
Butanoic acid propyl ester	$C_7H_{14}O_2$	1-Propanol	C_3H_8O	299, 300
		2-Propanol	C_3H_8O	602

1-Butanol	$C_4H_{10}O$	1-Propanol	C_3H_8O	159–163
		2-Propanol	C_3H_8O	487–491
2-Butanol	$C_4H_{10}O$	1-Propanol	C_3H_8O	164
		2-Propanol	C_3H_8O	492
tert-Butanol	$C_4H_{10}O$	1-Propanol	C_3H_8O	165
		2-Propanol	C_3H_8O	493–500
2-Butanone	C_4H_8O	1-Propanol	C_3H_8O	139–145
		2-Propanol	C_3H_8O	440–449
cis-2-Butene	C_4H_8	2-Propanol	C_3H_8O	438
trans-2-Butene	C_4H_8	2-Propanol	C_3H_8O	439
Butyl chloride	C_4H_9Cl	2-Propanol	C_3H_8O	480–482
Butyraldehyde	C_4H_8O	1-Propanol	C_3H_8O	146, 147
Carbonic acid diethyl ester	$C_5H_{10}O_3$	1-Propanol	C_3H_8O	204
Carbonic acid dimethyl ester	$C_3H_6O_3$	1-Propanol	C_3H_8O	104–107
		2-Propanol	C_3H_8O	417–419
Chlorobenzene	C_6H_5Cl	1-Propanol	C_3H_8O	222–227
		2-Propanol	C_3H_8O	539, 540
Chloroform	$CHCl_3$	1-Propanol	C_3H_8O	58
		2-Propanol	C_3H_8O	367
Coumarin	$C_9H_6O_2$	1-Propanol	C_3H_8O	347
Cyclohexane	C_6H_{12}	1-Propanol	C_3H_8O	243–252
		2-Propanol	C_3H_8O	553–559, 561
		2-Propen-1-ol	C_3H_6O	46–49
Cyclohexylamine	$C_6H_{13}N$	1-Propanol	C_3H_8O	258
		2-Propanol	C_3H_8O	570
Decalin (Isomer not specified)	$C_{10}H_{18}$	2-Propanol	C_3H_8O	641
Decane	$C_{10}H_{22}$	2-Propanol	C_3H_8O	642
Dibromoethane [R30B2]	CH_2Br_2	1-Propanol	C_3H_8O	60

1,2-Dichloroethane	$C_2H_4Cl_2$	1-Propanol	C_3H_8O	78–82
		2-Propen-1-ol	C_3H_6O	34–36
		2-Propyn-1-ol	C_3H_4O	10–12
Dichloromethane	CH_2Cl_2	2-Propanol	C_3H_8O	368
1,1-Diethoxyethane	$C_6H_{14}O_2$	2-Propanol	C_3H_8O	593, 594
Diethylene glycol	$C_4H_{10}O_3$	2-Propanol	C_3H_8O	507
Diethyl ether	$C_4H_{10}O$	1-Propanol	C_3H_8O	166
Diisopropyl ether	$C_6H_{14}O$	1-Propanol	C_3H_8O	264–266
		2-Propanol	C_3H_8O	575–579
Dimethoxymethane	$C_3H_8O_2$	2-Propanol	C_3H_8O	427
2,3-Dimethyl-2-butene	C_6H_{12}	2-Propanol	C_3H_8O	560
3,7-Dimethyl-6-octen-1-yn-3-ol	$C_{10}H_{16}O$	1-Propanol	C_3H_8O	357
6,10-Dimethyl-3,5,9-undecatrien-2-one	$C_{13}H_{20}O$	2-Propanol	C_3H_8O	643
N,N-Dimethylethanolamine	$C_4H_{11}NO$	2-Propanol	C_3H_8O	508
Dimethyl ether	C_2H_6O	1-Propanol	C_3H_8O	85
N,N-Dimethylformamide (DMF)	C_3H_7NO	1-Propanol	C_3H_8O	108–115
		2-Propanol	C_3H_8O	422–426
2,4-Dimethyl-3-pentanol	$C_7H_{16}O$	1-Propanol	C_3H_8O	316, 317
2,4-Dimethyl-3-pentanone	$C_7H_{14}O$	1-Propanol	C_3H_8O	298
Dimethyl sulfoxide	C_2H_6OS	1-Propanol	C_3H_8O	86, 87
		2-Propyn-1-ol	C_3H_4O	13
N,N-Dimethylthioformamide	C_3H_7NS	1-Propanol	C_3H_8O	116
1,4-Dioxane	$C_4H_8O_2$	1-Propanol	C_3H_8O	150
		2-Propanol	C_3H_8O	456–463
Diphenylacetylene	$C_{14}H_{10}$	1-Propanol	C_3H_8O	363
Dipropylamine	$C_6H_{15}N$	1-Propanol	C_3H_8O	280–285
		2-Propanol	C_3H_8O	595

Di-n-propyl ether	$C_6H_{14}O$	1-Propanol	C_3H_8O	267–274
		2-Propanol	C_3H_8O	580–587
Epichlorohydrin	C_3H_5ClO	2,3-Epoxy-1-propanol	$C_3H_6O_2$	53, 54
		2-Propanol	C_3H_8O	396–400
1,2-Epoxybutane	C_4H_8O	2-Propanol	C_3H_8O	450
2,3-Epoxy-1-propanol	$C_3H_6O_2$	2-Propen-1-ol	C_3H_6O	38
2-Ethoxyethanol	$C_4H_{10}O_2$	1-Propanol	C_3H_8O	174
		2-Propanol	C_3H_8O	504
Ethyl acetate	$C_4H_8O_2$	1,2-Propanediol	$C_3H_8O_2$	644
		1-Propanol	C_3H_8O	151
		2-Propanol	C_3H_8O	464–470
Ethylbenzene	C_8H_{10}	1-Propanol	C_3H_8O	319, 320
		2-Propanol	C_3H_8O	612
Ethyl tert-butyl ether (ETBE)	$C_6H_{14}O$	1-Propanol	C_3H_8O	275
		2-Propanol	C_3H_8O	588–592
Ethyl butyrate	$C_6H_{12}O_2$	1-Propanol	C_3H_8O	255, 256
		2-Propanol	C_3H_8O	567, 568
Ethylenediamine	$C_2H_8N_2$	2-Propanol	C_3H_8O	394
Formaldehyde	CH_2O	1-Propanol	C_3H_8O	61
		2-Propen-1-ol	C_3H_6O	14–16
Formic acid butyl ester	$C_5H_{10}O_2$	1-Propanol	C_3H_8O	195
		2-Propanol	C_3H_8O	521
Formic acid ethyl ester	$C_3H_6O_2$	1-Propanol	C_3H_8O	99
		2-Propanol	C_3H_8O	408, 409
Formic acid propyl ester	$C_4H_8O_2$	1-Propanol	C_3H_8O	152, 153
		2-Propanol	C_3H_8O	471, 472
Furfural	$C_5H_4O_2$	1-Propanol	C_3H_8O	176
Heptane	C_7H_{16}	1-Propanol	C_3H_8O	303–315
		2-Propanol	C_3H_8O	604–609

1,1,2,3,3,3-Hexafluoropropyl-2,2,2-trifluoroethyl ether	$C_5H_3F_9O$	1-Propanol	C_3H_8O	175
Hexamethyl disiloxane	$C_6H_{18}OSi_2$	1-Propanol	C_3H_8O	286–288
		2-Propen-1-ol	C_3H_6O	52
Hexane	C_6H_{14}	1-Propanol	C_3H_8O	259–263
		2-Propanol	C_3H_8O	571–574
		2-Propen-1-ol	C_3H_6O	50, 51
1-Hexene	C_6H_{12}	2-Propanol	C_3H_8O	562
4-Hydroxy-3-methoxybenzaldehyde	$C_8H_8O_3$	1-Propanol	C_3H_8O	318
Isopropylbenzene	C_9H_{12}	2-Propanol	C_3H_8O	634–636
Isopropyl tert-butyl ether	$C_7H_{16}O$	2-Propanol	C_3H_8O	610, 611
Linalool	$C_{10}H_{18}O$	1-Propanol	C_3H_8O	358–362
2-Methoxyethanol	$C_3H_8O_2$	1-Propanol	C_3H_8O	125, 126
1-Methoxy-2-propanol	$C_4H_{10}O_2$	2-Propanol	C_3H_8O	505, 506
Methyl acetate	$C_3H_6O_2$	1-Propanol	C_3H_8O	100–103
		2-Propanol	C_3H_8O	410–416
Methyl tert-amyl ether (TAME)	$C_6H_{14}O$	1-Propanol	C_3H_8O	276–278
Methyl butanoate	$C_5H_{10}O_2$	1-Propanol	C_3H_8O	196–202
		2-Propanol	C_3H_8O	522–528
2-Methyl-1-butanol	$C_5H_{12}O$	1-Propanol	C_3H_8O	209
3-Methyl-1-butanol	$C_5H_{12}O$	1-Propanol	C_3H_8O	210, 211
Methyl tert-butyl ether (MTBE)	$C_5H_{12}O$	1-Propanol	C_3H_8O	212–216
		2-Propanol	C_3H_8O	531–534
Methylcyclohexane	C_7H_{14}	1-Propanol	C_3H_8O	295–297
		2-Propanol	C_3H_8O	600, 601
Methyl formate	$C_2H_4O_2$	2-Propanol	C_3H_8O	392
4-Methyl-1-pentanol	$C_6H_{14}O$	1-Propanol	C_3H_8O	279
4-Methyl-2-pentanone	$C_6H_{12}O$	2-Propanol	C_3H_8O	563–565

2-Methylphenol	C_7H_8O	1-Propanol	C_3H_8O	291
		2-Propanol	C_3H_8O	598
4-Methylphenol	C_7H_8O	1-Propanol	C_3H_8O	292
		2-Propanol	C_3H_8O	599
Methyl phenyl ether	C_7H_8O	1-Propanol	C_3H_8O	293, 294
1-Methylpiperazine	$C_5H_{12}N_2$	1-Propanol	C_3H_8O	208
Methyl propanoate	$C_4H_8O_2$	1-Propanol	C_3H_8O	154–158
		2-Propanol	C_3H_8O	473–479
2-Methyl-1-propanol	$C_4H_{10}O$	1-Propanol	C_3H_8O	167–173
		2-Propanol	C_3H_8O	501–503
N-Methyl-2-pyrrolidone	C_5H_9NO	1-Propanol	C_3H_8O	178
		2-Propanol	C_3H_8O	509, 510
Morpholine	C_4H_9NO	2-Propanol	C_3H_8O	483–486
Nitrobenzene	$C_6H_5NO_2$	1-Propanol	C_3H_8O	228
		2-Propanol	C_3H_8O	541
Nitroethane	$C_2H_5NO_2$	1-Propanol	C_3H_8O	84
		2-Propanol	C_3H_8O	393
Nitromethane	CH_3NO_2	1-Propanol	C_3H_8O	62, 63
1-Nonyne	C_9H_{16}	1-Propanol	C_3H_8O	352–356
1,7-Octadiene	C_8H_{14}	2-Propanol	C_3H_8O	620
Octane	C_8H_{18}	1-Propanol	C_3H_8O	337–342
		2-Propanol	C_3H_8O	623–626
1-Octene	C_8H_{16}	2-Propanol	C_3H_8O	621
1-Octyne	C_8H_{14}	1-Propanol	C_3H_8O	330–335
Pentane	C_5H_{12}	1-Propanol	C_3H_8O	205–207
2,4-Pentanedione	$C_5H_8O_2$	1-Propanol	C_3H_8O	177
1-Pentanol	$C_5H_{12}O$	1-Propanol	C_3H_8O	217–219
		2-Propanol	C_3H_8O	535, 536

2-Pentanol	$C_5H_{12}O$	1-Propanol	C_3H_8O	220
		2-Propanol	C_3H_8O	537
tert-Pentanol	$C_5H_{12}O$	2-Propanol	C_3H_8O	538
3-Pentanone	$C_5H_{10}O$	1-Propanol	C_3H_8O	179, 180
		2-Propanol	C_3H_8O	511–513
Phenol	C_6H_6O	1-Propanol	C_3H_8O	240–242
		2-Propanol	C_3H_8O	550–552
Propanal	C_3H_6O	1-Propanol	C_3H_8O	98
Propanoic acid butyl ester	$C_7H_{14}O_2$	1-Propanol	C_3H_8O	301, 302
		2-Propanol	C_3H_8O	603
Propanoic acid ethyl ester	$C_5H_{10}O_2$	1-Propanol	C_3H_8O	203
		2-Propanol	C_3H_8O	529, 530
Propanoic acid propyl ester	$C_6H_{12}O_2$	1-Propanol	C_3H_8O	257
		2-Propanol	C_3H_8O	569
1-Propanol	C_3H_8O	2-Propen-1-ol	C_3H_6O	39–42
2-Propanol	C_3H_8O	1-Propanol	C_3H_8O	117–124
Propionitrile	C_3H_5N	1-Propanol	C_3H_8O	87
		2-Propanol	C_3H_8O	401
Propyl bromide	C_3H_7Br	2-Propanol	C_3H_8O	420, 421
1,2-Propylene oxide	C_3H_6O	2-Propanol	C_3H_8O	406, 407
1,1,2,2-Tetrachloro-1,2-difluoroethane [R112]	$C_2Cl_4F_2$	2-Propanol	C_3H_8O	373, 374
1,1,2,2-Tetrachloroethane	$C_2H_2Cl_4$	2-Propanol	C_3H_8O	379
		2-Propen-1-ol	C_3H_6O	22–24
		2-Propyn-1-ol	C_3H_4O	4–6
Tetrachloroethylene	C_2Cl_4	1-Propanol	C_3H_8O	64, 65
		2-Propanol	C_3H_8O	369–372
		2-Propen-1-ol	C_3H_6O	17, 18
Tetrachloromethane	CCl_4	1-Propanol	C_3H_8O	55–57
		2-Propanol	C_3H_8O	364–366

Tetraethoxysilane	$C_8H_{20}O_4Si$	1-Propanol	C_3H_8O	346
		2-Propanol	C_3H_8O	633
Tetraethylene glycol	$C_8H_{18}O_5$	2-Propanol	C_3H_8O	632
Tetrahydrofuran	C_4H_8O	1-Propanol	C_3H_8O	148, 149
		2-Propanol	C_3H_8O	451–455
Toluene	C_7H_8	1-Propanol	C_3H_8O	289, 290
		2-Propanol	C_3H_8O	596, 597
1,1,1-Trichloroethane [R140A]	$C_2H_3Cl_3$	2-Propanol	C_3H_8O	380, 381
		2-Propen-1-ol	C_3H_6O	25–27
		2-Propyn-1-ol	C_3H_4O	7–9
Trichloroethylene	C_2HCl_3	1-Propanol	C_3H_8O	66–69
		2-Propanol	C_3H_8O	375–378
		2-Propen-1-ol	C_3H_6O	19–21
		2-Propyn-1-ol	C_3H_4O	1–3
1,1,1-Trichloroethane [R140A]	$C_2H_3Cl_3$	1-Propanol	C_3H_8O	70–72
2,2,2-Trifluoroethanol	$C_2H_3F_3O$	1-Propanol	C_3H_8O	73
1,3,5-Trimethylbenzene	C_9H_{12}	1-Propanol	C_3H_8O	348–351
		2-Propanol	C_3H_8O	637–640
2,2,4-Trimethylpentane	C_8H_{18}	1-Propanol	C_3H_8O	343–345
		2-Propanol	C_3H_8O	627–631
m-Xylene	C_8H_{10}	1-Propanol	C_3H_8O	321–324
		2-Propanol	C_3H_8O	613–615
o-Xylene	C_8H_{10}	1-Propanol	C_3H_8O	325, 326
		2-Propanol	C_3H_8O	616, 617
p-Xylene	C_8H_{10}	1-Propanol	C_3H_8O	327–329
		2-Propanol	C_3H_8O	618, 619

C_3H_8O	1-Propanol	C_3H_6O	Acetone	C_3H_8O	2-Propanol	645
		C_3H_7NO	N,N-Dimethylformamide (DMF)	$C_4H_{10}O$	1-Butanol	646–648
		C_4H_8O	Tetrahydrofuran	C_7H_{16}	Heptane	649
		C_6H_6	Benzene	C_6H_{12}	Cyclohexane	650, 651
		C_6H_{14}	Hexane	C_7H_{16}	Heptane	652
		$C_6H_{14}O$	Di-N-propyl ether	$C_7H_{14}O_2$	Propanoic acid butyl ester	653, 654
		C_7H_{16}	Heptane	C_8H_{18}	Octane	655
C_3H_8O	2-Propanol	$CHCl_3$	Chloroform	C_6H_5Cl	Chlorobenzene	656, 657
		CH_2Cl_2	Dichloromethane	$C_3H_6O_2$	Methyl acetate	658
		C_2H_3N	Acetonitrile	C_4H_9Cl	Butyl chloride	659
		C_3H_7NO	N,N-Dimethylformamide (DMF)	$C_4H_{10}O$	1-Butanol	660–662
		C_4H_8O	2-Butanone	$C_4H_{10}O$	1-Butanol	663
		C_4H_8O	Tetrahydrofuran	C_4H_9Cl	Butyl chloride	664
				$C_6H_{14}O$	Ethyl tert-butyl ether (ETBE)	665
		C_4H_9Cl	Butyl chloride	C_6H_{14}	Hexane	666, 667
		$C_4H_{10}O_2$	1-Methoxy-2-propanol	$C_6H_{14}O$	Diisopropyl ether	668
		C_6H_6	Benzene	C_6H_{12}	Cyclohexane	669–671
		C_6H_6O	Phenol	$C_{10}H_{18}$	Decalin (Isomer not specified)	672
		C_6H_{12}	Cyclohexane	C_7H_8	Toluene	673
		$C_6H_{12}O$	4-Methyl-2-Pentanone	$C_6H_{14}O$	Diisopropyl ether	674–677

1-Propanol	C_3H_8O	Acetone	C_3H_6O	2-Propanol	C_3H_8O	645
		Benzene	C_6H_6	Cyclohexane	C_6H_{12}	650, 651
		1-Butanol	$C_4H_{10}O$	N,N-Dimethylformamide (DMF)	C_3H_7NO	646–648
		Di-N-propyl ether	$C_6H_{14}O$	Propanoic acid butyl ester	$C_7H_{14}O_2$	653, 654
		Heptane	C_7H_{16}	Hexane	C_6H_{14}	652
				Octane	C_8H_{18}	655
				Tetrahydrofuran	C_4H_8O	649
2-Propanol	C_3H_8O	Acetonitrile	C_2H_3N	Butyl chloride	C_4H_9Cl	659
		Benzene	C_6H_6	Cyclohexane	C_6H_{12}	669–671
		1-Butanol	$C_4H_{10}O$	2-Butanone	C_4H_8O	663
				N,N-Dimethylformamide (DMF)	C_3H_7NO	660–662
		Butyl chloride	C_4H_9Cl	Hexane	C_6H_{14}	666, 667
				Tetrahydrofuran	C_4H_8O	664
		Chlorobenzene	C_6H_5Cl	Chloroform	$CHCl_3$	656, 657
		Cyclohexane	C_6H_{12}	Toluene	C_7H_8	673
		Decalin (Isomer not specified)	$C_{10}H_{18}$	Phenol	C_6H_6O	672
		Dichloromethane	CH_2Cl_2	Methyl acetate	$C_3H_6O_2$	658
		Diisopropyl ether	$C_6H_{14}O$	1-Methoxy-2-propanol	$C_4H_{10}O_2$	668
				4-Methyl-2-pentanone	$C_6H_{12}O$	674–677
		Ethyl tert-butyl ether (ETBE)	$C_6H_{14}O$	Tetrahydrofuran	C_4H_8O	665

C_2H_3N	Acetonitrile	C_3H_8O	1-Propanol	$C_4H_{10}O$	tert-butanol	C_6H_6	Benzene	678
				$C_4H_{10}O$	2-Methyl-1-propanol	C_6H_6	Benzene	679
		C_3H_8O	2-Propanol	$C_4H_{10}O$	2-Butanol	C_6H_6	Benzene	680
				$C_4H_{10}O$	2-Methyl-1-propanol	C_6H_6	Benzene	681
C_3H_6O	Acetone	C_3H_8O	2-Propanol	C_6H_6	Benzene	C_6H_{12}	Cyclohexane	682, 683
				C_6H_{14}	Hexane	C_7H_8	Toluene	684

1-Propanol C_3H_8O	Acetonitrile	C_2H_3N	Benzene	C_6H_6	tert-butanol	$C_4H_{10}O$	678
	Acetonitrile	C_2H_3N	Benzene	C_6H_6	2-Methyl-1-propanol	$C_4H_{10}O$	679
	Benzene	C_6H_6	Acetonitrile	C_2H_3N	tert-butanol	$C_4H_{10}O$	678
	Benzene	C_6H_6	Acetonitrile	C_2H_3N	2-Methyl-1-propanol	$C_4H_{10}O$	679
	tert-butanol	$C_4H_{10}O$	Acetonitrile	C_2H_3N	Benzene	C_6H_6	678
	2-Methyl-1-propanol	$C_4H_{10}O$	Acetonitrile	C_2H_3N	Benzene	C_6H_6	679
2-Propanol C_3H_8O	Acetone	C_3H_6O	Benzene	C_6H_6	Cyclohexane	C_6H_{12}	682, 683
	Acetone	C_3H_6O	Hexane	C_6H_{14}	Toluene	C_7H_8	684
	Acetonitrile	C_2H_3N	Benzene	C_6H_6	2-Butanol	$C_4H_{10}O$	680
	Acetonitrile	C_2H_3N	Benzene	C_6H_6	2-Methyl-1-propanol	$C_4H_{10}O$	681
	Benzene	C_6H_6	Acetone	C_3H_6O	Cyclohexane	C_6H_{12}	682, 683
	Benzene	C_6H_6	Acetonitrile	C_2H_3N	2-Butanol	$C_4H_{10}O$	680
	Benzene	C_6H_6	Acetonitrile	C_2H_3N	2-Methyl-1-propanol	$C_4H_{10}O$	681
	2-Butanol	$C_4H_{10}O$	Acetonitrile	C_2H_3N	Benzene	C_6H_6	680
	Cyclo-hexane	C_6H_{12}	Acetone	C_3H_6O	Benzene	C_6H_6	682, 683
	Hexane	C_6H_{14}	Acetone	C_3H_6O	Toluene	C_7H_8	684
	2-Methyl-1-propanol	$C_4H_{10}O$	Acetonitrile	C_2H_3N	Benzene	C_6H_6	681
	Toluene	C_7H_8	Acetone	C_3H_6O	Hexane	C_6H_{14}	684