J. Gmehling
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VAPOR-LIQUID EQUILIBRIUM DATA COLLECTION

Aqueous Systems
Supplement 4
$C_4H_{10}O_2$–$C_{12}H_{24}$

Chemistry Data Series

Vol. I, Part 1d
(in conjunction with Part 1c)

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Vapor-Liquid Equilibrium Data Collection

1 d

Aqueous Systems

Supplement 4

$C_4H_{10}O_2$–$C_{12}H_{24}$

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

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Technische Chemie
Universität Oldenburg

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1 d

Aqueous Systems
(Supplement 4)

$C_4H_{10}O_2$ – $C_8H_{20}N_2O_3$

SUBJECTS OF VOLUME I

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A substance index to Volume I on CD-ROM is available from the DECHEMA e.V. and its agents.

AUTHORS' PREFACE

With this publication we continue the series of supplements of our Vapor-Liquid Equilibrium Data Collection (Part 1) for aqueous systems. Due to the large amount of data the collection will be published as two books, to be sold as one publication. The indexes are to be found at the end of Volumes I 1c and 1d.

The data in this book are taken from the Dortmund Data Bank. The Dortmund Data Bank covers a wide range of properties in addition to VLE, LLE, h^E, γ^∞, azeotropic data, e.g. gas solubilities, solid-liquid equilibria and the largest collection of pure component properties. The Dortmund Data Bank is also available in electronic form. The electronic version can be obtained from DDBST GmbH, Oldenburg (www.ddbst.de), Germany, DECHEMA e.V., Frankfurt am Main, Germany or FIZ Chemie, Berlin, Germany. DDBST can also supply a software package designed to process the data and to use them efficiently for process simulation. Online versions of the data base as DETHERM are hosted by STN International (Columbus, Ohio, USA, Karlsruhe, Germany and Tokyo, Japan) and DECHEMA e.V. (via the Internet as DETHERM... on the WEB). The publication of this collection would not have been possible without the cooperation and labors of all our colleagues at DDBST GmbH, in particular: J. Menke, J. Krafczyk and Dr. J. Ahlers.

In this work parameters have often not been published, because experimental data is only available for a limited concentration range, often caused by a large miscibility gap. Binary parameters have not been fitted for systems with strong electrolytes, e.g. sulfuric acid, hydrochloric acid, nitric acid or where chemical reactions, e.g. in systems containing formaldehyde need to be taken into account.

The role of the editorial team in scientific book production is often undervalued. We however recognize the worth of the endeavors of Dr. R. Sass and Dr. N. Forsyth with other members of the Information System and Data Base Department at DECHEMA e.V. and would like to express our gratitude for their rapid and efficient transformation of a collection of pages of data into a finished book.

Oldenburg, November 2003

J. Gmehling U. Onken

EXECUTIVE EDITOR'S PREFACE

The aim of DECHEMA e.V., (The Society for Chemical Technology and Biotechnology) when it was founded in 1926 was to improve cooperation between chemist and engineer. As the importance of mathematical modelling, computer simulation and optimisation became apparent in the mid-nineteen-seventies, this ideal resulted in the production and publication of collections of basic thermophysical data in both electronic and book form. This is not data that could have easily found a publisher outside the engineering societies, because of its sheer volume and limited circle of interest. By its sponsoring and publication of the DECHEMA Chemistry Data Series DECHEMA e.V. has been associated with these endeavours for over a quarter of a century. Much of the original work to determine the values obtained was financed by the German Ministry of Research.

It is to be hoped that publication of this data collection by DECHEMA e.V. in the DECHEMA Chemistry Data Series will inspire other authors to consider publishing their collections of thermophysical data. DECHEMA e.V. is always pleased to assist colleagues from the thermophysical data community in preparing their results, their studies, their collections and their assessments for publication. DECHEMA e.V. is always prepared to enlarge the scope of the DECHEMA Chemistry Data Series and is thus pleased to hear from readers, designers, scientists and engineers of areas where thermophysical data is not available or scarce. We hope that the end user finds the data of utility and of interest.

Frankfurt am Main, November 2003 Gerhard Kreysa

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$C_8H_{11}N$	2,4,6-Trimethylpyridine	H_2O	Water	205
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$C_8H_{16}O_2$	1-Butanoic Acid Butyl Ester	H_2O	Water	207
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R = Recommended Values

Benzene	C_6H_6	Water	H_2O	112–114
Benzoic Acid	$C_7H_6O_2$	Water	H_2O	186
Benzyl Alcohol	C_7H_8O	Water	H_2O	187
1,3-Bis (Dimethylamino) -2-Propanol	$C_7H_{18}N_2O$	Water	H_2O	203
n,n'-Bis (2-Hydroxyethyl) -Piperazine	$C_8H_{18}N_2O_2$	Water	H_2O	208
1,4-Butanediol	$C_4H_{10}O_2$	Water	H_2O	1–9
1-Butanoic Acid Butyl Ester	$C_8H_{16}O_2$	Water	H_2O	207
2-Butoxy-Ethanol	$C_6H_{14}O_2$	Water	H_2O	168–172
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Butyl Formate	$C_5H_{10}O_2$	Water	H_2O	79, 80
Butylamine	$C_4H_{11}N$	Water	H_2O	22
6-Caprolactam	$C_6H_{11}NO$	Water	H_2O	141–149
Cyclopentanol	$C_5H_{10}O$	Water	H_2O	68
Diacetone Alcohol	$C_6H_{12}O_2$	Water	H_2O	155–156
Dibutyl Ether	$C_8H_{18}O$	Water	H_2O	209
2,2'-Diethanolamine (DEA)	$C_4H_{11}NO_2$	Water	H_2O	28–34
Diethylene Glycol	$C_4H_{10}O_3$	Water	H_2O	18–21
Diethylene Glycol Dimethyl Ether	$C_6H_{14}O_3$	Water	H_2O	173
1,2-Dihydroxybenzene (Pyrocatechol)	$C_6H_6O_2$	Water	H_2O	129–132
1,3-Dihydroxybenzene (Resorcinol)	$C_6H_6O_2$	Water	H_2O	133–135
Diisopropyl Ether	$C_6H_{14}O$	Water	H_2O	159, 160
1,2-Dimethoxyethane	$C_4H_{10}O_2$	Water	H_2O	10
n,n-Dimethyl Tert-Butylamine	$C_6H_{15}N$	Water	H_2O	174–179
Dimethyl Ethyl Amine	$C_4H_{11}N$	Water	H_2O	23–27
2,4-Dimethyl-3-Pentanol	$C_7H_{16}O$	Water	H_2O	201–202

2,4-Dimethyl-3-Pentanone	$C_7H_{14}O$	Water	H_2O	194–195
2-Ethoxyethanol	$C_4H_{10}O_2$	Water	H_2O	11–14, 15 R
Ethyl Acrylate	$C_5H_8O_2$	Water	H_2O	42–45
Ethyl Butyl Amine	$C_6H_{15}N$	Water	H_2O	180
Ethyl Tert-Butyl Ether (ETBE)	$C_6H_{14}O$	Water	H_2O	161–166
3-Ethylpyridine	C_7H_9N	Water	H_2O	188
Furfural	$C_5H_4O_2$	Water	H_2O	35–37
Furfuryl Alcohol	$C_5H_6O_2$	Water	H_2O	41
Heptane	C_7H_{16}	Water	H_2O	200
3-Heptanone	$C_7H_{14}O$	Water	H_2O	196–199
Hexamethylene Imine	$C_6H_{13}N$	Water	H_2O	157
1,6-Hexanediamine	$C_6H_{16}N_2$	Water	H_2O	183–185
1-Hexanol	$C_6H_{14}O$	Water	H_2O	167
2-Isopropoxyethanol	$C_5H_{12}O_2$	Water	H_2O	109–110
Levulinic Acid (4-Oxopentanoic acid)	$C_5H_8O_3$	Water	H_2O	51
m-Xylene	C_8H_{10}	Water	H_2O	204
Methacrylic Acid Butyl Ester	$C_8H_{14}O_2$	Water	H_2O	206
1-Methoxy-2-Propanol	$C_4H_{10}O_2$	Water	H_2O	16–17
Methyl Tert-Butyl Ether	$C_5H_{12}O$	Water	H_2O	97
Methyl Butyrate	$C_5H_{10}O_2$	Water	H_2O	81–84
n-Methyl-6-Caprolactam	$C_7H_{13}NO$	Water	H_2O	191–193
Methyl Methacrylate	$C_5H_8O_2$	Water	H_2O	46–47
n-Methyl Morpholine	$C_5H_{11}NO$	Water	H_2O	88–90
4-Methyl-2-Pentanone	$C_6H_{12}O$	Water	H_2O	150–152
2-Methyl-1-Butanol	$C_5H_{12}O$	Water	H_2O	92–94
3-Methyl-1-Butanol	$C_5H_{12}O$	Water	H_2O	95–96

2-Methyl-3-Buten-2-ol	$C_5H_{10}O$	Water	H_2O	69–70
Methyldiethanolamine (MDEA)	$C_5H_{13}NO_2$	Water	H_2O	111
1-Methylpiperazine	$C_5H_{12}N_2$	Water	H_2O	91
2-Methylpiperidine	$C_6H_{13}N$	Water	H_2O	158
2-Methylpyridine	C_6H_7N	Water	H_2O	136
3-Methylpyridine	C_6H_7N	Water	H_2O	137–140
n-Methyl-2-Pyrrolidone (NMP)	C_5H_9NO	Water	H_2O	52–66, 67 R
1-Octanol	$C_8H_{18}O$	Water	H_2O	210–212
2,4-Pentanedione	$C_5H_8O_2$	Water	H_2O	48
1-Pentanol	$C_5H_{12}O$	Water	H_2O	98
Tert-Pentanol	$C_5H_{12}O_2$	Water	H_2O	99–108
3-Pentanone	$C_5H_{10}O$	Water	H_2O	71–78
3-Pentenoic Acid (Isomer not specified)	$C_5H_8O_2$	Water	H_2O	49–50
Phenol	C_6H_6O	Water	H_2O	115–127, 128 R
Piperidine	$C_5H_{11}N$	Water	H_2O	87
1,2-Propyleneglycol Diacetate	$C_7H_{12}O_4$	Water	H_2O	189–190
Pyridine	C_5H_5N	Water	H_2O	38–40
Tetraethylene Glycol	$C_8H_{18}O_5$	Water	H_2O	213–215
Tetrahydrofurfuryl Alcohol	$C_5H_{10}O_2$	Water	H_2O	85–86
Triethylamine	$C_6H_{15}N$	Water	H_2O	181–182
2,4,6-Trimethylpyridine	$C_8H_{11}N$	Water	H_2O	205
Tris (Hydroxyethyl) Ethylenediamine	$C_8H_{20}N_2O_3$	Water	H_2O	216

R = Recommended Values

H_2O	HBr	Hydrogen Bromide	HCl	Hydrogen Chloride	217
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	HCl	Hydrogen Chloride	HBr	Hydrogen Bromide	217
			H_2O_4S	Sulfuric Acid	219–220
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	H_2O_4S	Sulfuric Acid	HBr	Hydrogen Bromide	218
			HCl	Hydrogen Chloride	219–220
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	CCl_4	Tetrachloromethane	CH_4O	Methanol	223
			C_2H_6O	Ethanol	224
			C_3H_8O	1-Propanol	225
				2-Propanol	226
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	CH_2O_2	Formic Acid	$C_3H_6O_2$	Propionic Acid	237–239
			C_3H_7NO	n,n-Dimethylformamide (DMF)	240
			$C_5H_{10}O_2$	Pentanoic Acid	241
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			$C_6H_{12}O_2$	Isobutyl Acetate	380

H_2O	C_2H_6O	Ethanol	C_6H_{14}	Hexane	381
			$C_6H_{14}O$	Ethyl Tert-Butyl Ether (ETBE)	382
				Methyl Tert-Amyl Ether (TAME)	383–384
			$C_6H_{14}O_4$	Triethylene Glycol	385
			C_7H_8	Toluene	386
			$C_7H_{14}O_2$	Acetic Acid 3-Methylbutyl Ester	387
			C_8H_{10}	o-Xylene	388–389
				m-Xylene	390–391
				p-Xylene	392–393
			$C_8H_{16}O_2$	Hexanoic Acid Ethyl Ester	394
				Hexyl Acetate	395–396
			$C_8H_{18}O$	1-Octanol	397–398
			$C_{10}H_{20}O_2$	Octanoic Acid Ethyl Ester	399
	C_2H_6OS	Dimethyl Sulfoxide	C_2H_7NO	Monoethanolamine	400
			$C_4H_{10}O$	Tert.Butanol	401
	$C_2H_6O_2$	1,2-Ethanediol	C_2H_3N	Acetonitrile	310
			C_2H_6O	Ethanol	330
			C_3H_6O	Acetone	402
			$C_3H_8O_2$	1,2-Propanediol	403–405
	C_2H_7NO	Monoethanolamine	C_2H_6OS	Dimethyl Sulfoxide	400
	$C_2H_8N_2$	Ethylenediamine	C_2H_6O	Ethanol	331
	C_3H_3NO	Oxazole	C_2H_3N	Acetonitrile	311
	$C_3H_4O_2$	Acrylic Acid	$C_2H_4O_2$	Acetic Acid	317
	C_3H_5ClO	Epichlorohydrin	C_3H_8O	2-Propanol	406–408

H_2O	C_3H_6O	Acetone	$CHCl_3$	Chloroform	229–231
			CH_4O	Methanol	261–262
			$C_2H_6O_2$	1,2-Ethanediol	402
			$C_4H_6O_2$	Vinyl Acetate	409
			C_4H_8O	2-Butanone	410–411
				2-Methylpropanal	412–419
			$C_4H_8O_2$	1,4-Dioxane	420
				Ethyl Acetate	421
			C_6H_6	Benzene	422
			C_6H_6O	Phenol	423–434
			C_7H_8	Toluene	435
			C_9H_{12}	Isopropylbenzene	436–438
		Allyl Alcohol	C_4H_5N	Cis-Crotonitrile	439
	$C_3H_6O_2$	1,3-Dioxolane	CH_4O	Methanol	263–264
		Ethyl Formate	C_2H_6O	Ethanol	332
			$C_4H_8O_2$	Ethyl Acetate	440
		Methyl Acetate	CH_4O	Methanol	265
			$C_2H_4O_2$	Acetic Acid	319–320
		Propionic Acid	CH_2O_2	Formic Acid	237–239
			$C_2H_4O_2$	Acetic Acid	318
	$C_3H_6O_3$	1,3,5-Trioxane	CH_2O	Formaldehyde	236
			CH_4O	Methanol	266–268
	C_3H_7NO	n,n-Dimethylformamide (DMF)	CH_2O_2	Formic Acid	240
			CH_4O	Methanol	269
			C_2H_6O	Ethanol	333–335

H_2O	C_3H_7NO	n,n-Dimethylformamide (DMF)	C_3H_8O	1-Propanol	441
				2-Propanol	442
			$C_4H_8O_2$	1,4-Dioxane	443–448
				Ethyl Acetate	449–450
		n-Methylacetamide	CH_4O	Methanol	270
			C_2H_6O	Ethanol	336
	C_3H_8O	1-Propanol	CCl_4	Tetrachloromethane	225–226
			CH_3NO_2	Nitromethane	250–251
			$C_2H_4O_2$	Acetic Acid	321
			C_2H_6O	Ethanol	337–338
			C_3H_7NO	n,n-Dimethylformamide (DMF)	441
			C_3H_8O	2-Propanol	451–452
			$C_5H_{12}O$	1-Pentanol	453
			C_6H_6	Benzene	454
			C_7H_{16}	Heptane	455
			$C_{12}H_{10}O$	Diphenyl Ether	456
		2-Propanol	C_2H_3N	Acrylonitrile	457
			C_3H_5ClO	Epichlorohydrin	406–408
			C_3H_7NO	n,n-Dimethylformamide (DMF)	442
			C_3H_8O	1-Propanol	451–452
			$C_4H_{10}O$	1-Butanol	458–459
			C_5H_{12}	2-Methylbutane	460
			$C_6H_{14}O$	Diisopropyl Ether	461–463
	$C_3H_8O_2$	Dimethoxymethane	CH_4O	Methanol	271–274
		1,2-Propanediol	$C_2H_6O_2$	1,2-Ethanediol	403–405
			C_7H_8	Toluene	464–469
	$C_3H_8O_3$	Glycerol	C_2H_6O	Ethanol	339–341

H_2O	C_4H_5N	Allylcyanide	C_4H_5N	Cis-Crotonitrile	470
		Cis-Crotonitrile	C_3H_6O	Allyl Alcohol	439
			C_4H_5N	Allylcyanide	470
	C_4H_6O	Crotonaldehyde	C_2H_4O	Acetaldehyde	315
			C_4H_8O	Butyraldehyde	471
	$C_4H_6O_2$	Methacrylic Acid	$C_2H_4O_2$	Acetic Acid	322
			$C_5H_8O_2$	Methacrylic Acid Methyl Ester	472
		Vinyl Acetate	CH_4O	Methanol	275
			C_2H_4O	Acetaldehyde	316
			$C_2H_4O_2$	Acetic Acid	323
			C_3H_6O	Acetone	409
			$C_4H_{10}O$	Tert-Butanol	473
	$C_4H_6O_3$	Acetic Anhydride	$C_2H_4O_2$	Acetic Acid	324
	C_4H_8O	2-Butanone	C_3H_6O	Acetone	410–411
			$C_4H_{10}O$	2-Butanol	474
			$C_6H_{10}O$	Cyclohexanone	475
			C_7H_8	Toluene	476
		Butyraldehyde	C_2H_6O	Ethanol	342
			C_4H_6O	Crotonaldehyde	471
			C_4H_8O	2-Methylpropanal	477
			$C_4H_{10}O$	1-Butanol	478
		2-Methylpropanal	C_3H_6O	Acetone	412–419
			C_4H_8O	Butyraldehyde	477
			$C_4H_{10}O$	2-Methyl-1-Propanol	479
		Tetrahydrofuran	$C_4H_{10}O_2$	1,4-Butanediol	480–481
			C_6H_{12}	Cyclohexane	482

H_2O	$C_4H_8O_2$	1,4-Dioxane	C_2H_6O	Ethanol	343–344
			C_3H_6O	Acetone	420
			C_3H_7NO	n,n-Dimethylformamide	443–448
			$C_4H_8O_2$	Ethyl Acetate	483
			C_7H_8	Toluene	484
		Ethyl Acetate	C_2H_6O	Ethanol	345–350
			C_3H_6O	Acetone	421
			$C_3H_6O_2$	Ethyl Formate	440
			C_3H_7NO	n,n-Dimethylformamide	449–450
			$C_4H_8O_2$	1,4-Dioxane	483
	$C_4H_8O_3$	Methyl Methoxyacetate	CH_4O	Methanol	276
	C_4H_9NO	n,n-Dimethylacetamide	$C_2H_4O_2$	Acetic Acid	325
	$C_4H_{10}O$	1-Butanol	C_2H_6O	Ethanol	351, 352
			C_3H_8O	2-Propanol	458–459
			C_4H_8O	Butyraldehyde	478
			$C_4H_{10}O$	2-Methyl-1-Propanol	485, 505
			$C_6H_{12}O_2$	Butyl Acetate	486
			$C_7H_{12}O_2$	2-Propenoic Acid, Butyl Ester	487
			$C_8H_{18}O$	Dibutyl Ether	488–495
			$C_{12}H_{24}$	Triisobutylene	503
		2-Butanol	C_2H_6O	Ethanol	353
			C_4H_8O	2-Butanone	474
			$C_8H_{18}O$	Di-sec. Butyl Ether	496
			$C_{10}H_{22}$	Decane	497
			$C_{12}H_{24}$	Triisobutylene	498
		Tert-Butanol	CH_4O	Methanol	281–282
			C_2H_6O	Ethanol	359

H_2O	$C_4H_{10}O$	Tert-Butanol			
			C_2H_6OS	Dimethyl Sulfoxide	401
			$C_4H_6O_2$	Vinyl Acetate	473
			$C_4H_{10}O_2$	2-Ethoxyethanol	499
			$C_5H_{12}O$	Methyl Tert-Butyl Ether (MTBE)	500–501
			$C_6H_{14}O$	Ethyl Tert-Butyl Ether (ETBE)	502
			$C_{12}H_{24}$	Triisobutylene	503
		2-Methyl-1-Propanol	CH_4O	Methanol	278–280
			C_2H_6O	Ethanol	357–358
			C_4H_8O	2-Methylpropanal	479
			$C_4H_{10}O$	1-Butanol	485, 505
	$C_4H_{10}O_2$	1,4-Butanediol	C_4H_8O	Tetrahydrofuran	480–481
		2-Ethoxyethanol	$C_4H_{10}O$	Tert-Butanol	499
	$C_4H_{10}O_3$	Diethylene Glycol	CH_4O	Methanol	283–286
			C_5H_9NO	n-Methyl-2-Pyrrolidone	506
	$C_4H_{11}N$	Butylamine	C_2H_6O	Ethanol	360
			$C_6H_{15}N$	Triethylamine	507–508
	$C_5H_4O_2$	Furfural	CH_4O	Methanol	287
	C_5H_5N	Pyridine	C_6H_7N	3-Methylpyridine	509
	C_5H_8	Isoprene	C_2H_3N	Acetonitrile	312
	$C_5H_8O_2$	Ethyl Acetate	C_3H_6O	Acetone	421
			$C_3H_6O_2$	Ethyl Formate	440
			C_3H_7NO	n,n-Dimethylformamide	449–450
			$C_4H_8O_2$	1,4-Dioxane	483
		Methacrylic Acid Methyl Ester	CH_4O	Methanol	288–292
			$C_4H_6O_2$	Methacrylic Acid	472

H_2O	C_5H_9NO	n-Methyl-2-Pyrrolidone	C_5H_{10}	1-Pentene	510–511
			C_5H_{12}	2-Methylbutane	512–513
			C_6H_{10}	3-Methyl Cyclopentene	514–515
			C_6H_{12}	1-Hexene	516–519
			C_6H_{14}	3-Methylpentane	520–521
			C_7H_8	Toluene	522
			$C_4H_{10}O_3$	Diethylene Glycol	506
	C_5H_{10}	2-Methyl-2-Butene	C_2H_3N	Acetonitrile	313
		1-Pentene	C_5H_9NO	n-Methyl-2-Pyrrolidone	510–511
	$C_5H_{10}O$	3-Methyl-3-Buten-1-ol	$C_6H_{12}O_2$	4,4-Dimethyl-1,3-Dioxane	523
	$C_5H_{10}O_2$	Methyl Butyrate	CH_4O	Methanol	277
		Pentanoic Acid	CH_2O_2	Formic Acid	241
	C_5H_{12}	2-Methylbutane	C_3H_8O	2-Propanol	460
			C_5H_9NO	n-Methyl-2-Pyrrolidone	512–513
	$C_5H_{12}O$	Methyl Tert-Butyl Ether (MTBE)	CH_4O	Methanol	293–297
			$C_4H_{10}O$	Tert.Butanol	500–501
		Methyl Tert-Butyl Ether	C_2H_6O	Ethanol	364–365
		3-Methyl-1-Butanol	C_2H_6O	Ethanol	361–363
		1-Pentanol	C_3H_8O	1-Propanol	453
			$C_6H_{12}O_2$	Butyl Acetate	524
			C_8H_{18}	Octane	525
	C_6H_6	Benzene	C_2H_6O	Ethanol	366
			C_3H_6O	Acetone	422
			C_3H_8O	1-Propanol	454
	C_6H_6O	Phenol	C_2H_6O	Ethanol	367–368
			C_3H_6O	Acetone	423–434

H_2O	C_6H_6O	Phenol	C_8H_8O	Acetophenone	526
			C_9H_{12}	Isopropylbenzene	527–528
	C_6H_7N	3-Methylpyridine	C_5H_5N	Pyridine	509
	C_6H_{10}	3-Methyl Cyclopentene	C_5H_9NO	n-Methyl-2-Pyrrolidone	514–515
	$C_6H_{10}O$	Cyclohexanone	CH_4O	Methanol	298–300
	$C_6H_{11}BF_4N_2$	1-Ethyl-3-Methyl-1H-Imidazolium Tetrafluoroborat	$C_2H_4O_2$	Acetic Acid	371
			C_2H_6O	Ethanol	369–370
		Diethyl Ether	C_2H_6O	Ethanol	354–355, 372–379
			C_4H_8O	2-Butanone	475
				Tetrahydrofuran	482
			C_7H_8	Toluene	504
	C_6H_{12}	1-Hexene	C_5H_9NO	n-Methyl-2-Pyrrolidone	516–519
	$C_6H_{12}O$	Cyclohexanol	CH_4O	Methanol	301–303
	$C_6H_{12}O_2$	Butyl Acetate	$C_4H_{10}O$	1-Butanol	486
			$C_5H_{12}O$	1-Pentanol	524
		4,4-Dimethyl-1,3-Dioxane	$C_5H_{10}O$	3-Methyl-3-Buten-1-ol	523
		Isobutyl Acetate	C_2H_6O	Ethanol	380
	C_6H_{14}	Hexane	$C_2H_4O_2$	Acetic Acid	326
			C_2H_6O	Ethanol	381
		3-Methylpentane	C_5H_9NO	n-Methyl-2-Pyrrolidone	520–521
	$C_6H_{14}O$	Diisopropyl Ether	C_3H_8O	2-Propanol	461–463
		Ethyl Tert-Butyl Ether	C_2H_6O	Ethanol	382
		Ethyl Tert-Butyl Ether (ETBE)	$C_4H_{10}O$	Tert.Butanol	502
		Methyl Tertamyl Ether	CH_4O	Methanol	304–305
			C_2H_6O	Ethanol	383–384

H_2O	$C_6H_{14}O_4$	Triethylene Glycol	C_2H_6O	Ethanol	385
	$C_6H_{15}N$	Triethylamine	$C_4H_{11}N$	Butylamine	507–508
	C_7H_8	Toluene	C_2H_6O	Ethanol	386
			C_3H_6O	Acetone	435
			$C_3H_8O_2$	1,2-Propanediol	464–469
			C_4H_8O	2-Butanone	476
			$C_4H_8O_2$	1,4-Dioxane	484
			C_5H_9NO	n-Methyl-2-Pyrrolidone	522
			C_6H_{12}	Diethyl Ether	504
	$C_7H_{12}O_2$	2-Propenoic Acid, Butyl Ester	$C_4H_{10}O$	1-Butanol	487
	$C_7H_{14}O_2$	Acetic Acid 3-Methylbutyl Ester	C_2H_6O	Ethanol	387
	C_7H_{16}	Heptane	CH_3NO_2	Nitromethane	252
			C_3H_8O	1-Propanol	455
	C_8H_8O	Acetophenone	C_6H_6O	Phenol	526
	C_8H_{10}	o-Xylene	C_2H_6O	Ethanol	388–389
		m-Xylene	C_2H_6O	Ethanol	390–391
		p-Xylene	C_2H_6O	Ethanol	392–393
	$C_8H_{11}N$	n,n-Dimethylaniline	$C_2H_4O_2$	Acetic Acid	327–328
	$C_8H_{14}O_2$	Hexanoic Acid Ethyl Ester	C_2H_6O	Ethanol	394
		Hexyl Acetate	CH_4O	Methanol	306–307
			C_2H_6O	Ethanol	395–396
	C_8H_{18}	Octane	$C_5H_{12}O$	1-Pentanol	525
	$C_8H_{18}O$	Dibuthyl Ether	$C_4H_{10}O$	1-Butanol	488–496
		1-Octanol	CH_4O	Methanol	308–309
			C_2H_6O	Ethanol	397–398

H_2O	C_9H_{12}	Isopropylbenzene	C_3H_6O	Acetone	436–438
			C_6H_6O	Phenol	527–528
	$C_{10}H_{20}O_2$	Octanoic Acid Ethyl Ester	C_2H_6O	Ethanol	399
	$C_{10}H_{22}$	Decane	$C_4H_{10}O$	2-Butanol	497
	$C_{12}H_{10}O$	Diphenyl Ether	C_3H_8O	1-Propanol	456
	$C_{12}H_{24}$	Triisobutylene	$C_4H_{10}O$	2-Butanol	498, 503

Water	Acetaldehyde	C_2H_4O	Crotonaldehyde	C_4H_6O	315
			Ethanol	C_2H_6O	314
			Vinyl Acetate	$C_4H_6O_2$	316
	Acetic Acid	$C_2H_4O_2$	Acetic Anhydride	$C_4H_6O_3$	324
			Acrylic Acid	$C_3H_4O_2$	317
			Chloroform	$CHCl_3$	227–228
			n,n-Dimethylacetamide	C_4H_9NO	325
			n,n-Dimethylaniline	$C_8H_{11}N$	327–328
			1-Ethyl-3-Methyl-1H-Imidazolium Tetrafluoroborate	$C_6H_{11}BF_4N_2$	371
			Hexane	C_6H_{14}	326
			Methacrylic Acid	$C_4H_6O_2$	322
			Methyl Acetate	$C_3H_6O_2$	319–320
			1-Propanol	C_3H_8O	321
			Propionic Acid	$C_3H_6O_2$	318
			Vinyl Acetate	$C_4H_6O_2$	323
	Acetic Acid 3-Methylbutyl Ester	$C_7H_{14}O_2$	Ethanol	C_2H_6O	387
	Acetic Anhydride	$C_4H_6O_3$	Acetic Acid	$C_2H_4O_2$	324
	Acetone	C_3H_6O	Benzene	C_6H_6	422
			2-Butanone	C_4H_8O	410–411
			Chloroform	$CHCl_3$	229–231
			1,4-Dioxane	$C_4H_8O_2$	420
			1,2-Ethanediol	$C_2H_6O_2$	402
			Ethyl Acetate	$C_5H_8O_2$	421
			Isopropylbenzene	C_9H_{12}	436–438

Water	Acetone	C_3H_6O	Methanol	CH_4O	261–262
			2-Methylpropanal	C_4H_8O	412–419
			Phenol	C_6H_6O	423–434
			Toluene	C_7H_8	435
			Vinyl Acetate	$C_4H_6O_2$	409
	Acetonitrile	C_2H_3N	1,2-Ethanediol	$C_2H_6O_2$	310
			Isoprene	C_5H_8	312
			2-Methyl-2-Butene	C_5H_{10}	313
			Oxazole	C_3H_3NO	311
	Acetophenone	C_8H_8O	Phenol	C_6H_6O	526
	Acrylic Acid	$C_3H_4O_2$	Acetic Acid	$C_2H_4O_2$	317
	Acrylonitrile	C_2H_3N	2-Propanol	C_3H_8O	457
	Allyl Alcohol	C_3H_6O	Cis-Crotonitrile	C_4H_5N	439
	Allylcyanide	C_4H_5N	Cis-Crotonitrile	C_4H_5N	470
	Benzene	C_6H_6	Acetone	C_3H_6O	422
			Ethanol	C_2H_6O	366
			1-Propanol	C_3H_8O	454
	1,4-Butanediol	$C_4H_{10}O_2$	Tetrahydrofuran	C_4H_8O	480–481
	1-Butanol	$C_4H_{10}O$	Butyl Acetate	$C_6H_{12}O_2$	486
			Butyraldehyde	C_4H_8O	478
			Dibutyl Ether	$C_8H_{18}O$	488–495
			Ethanol	C_2H_6O	351–352, 356
			2-Methyl-1-Propanol	$C_4H_{10}O$	485, 505
			2-Propanol	C_3H_8O	458–459
			2-Propenoic Acid, Butyl Ester	$C_7H_{12}O_2$	487
			Triisobutylene	$C_{12}H_{24}$	503

Water	2-Butanol	$C_4H_{10}O$	2-Butanone	C_4H_8O	474
			Decane	$C_{10}H_{22}$	497
			Di-sec. Butyl Ether	$C_8H_{18}O$	496
			Ethanol	C_2H_6O	353
			Triisobutylene	$C_{12}H_{24}$	498
	Tert-Butanol	$C_4H_{10}O$	Dimethyl Sulfoxide	C_2H_6OS	401
			2-Ethoxyethanol	$C_4H_{10}O_2$	499
			Ethyl Tert-Butyl Ether (ETBE)	$C_6H_{14}O$	502
			Methanol	CH_4O	281–282
			Methyl Tert-Butyl Ether (MTBE)	$C_5H_{12}O$	500–501
			Triisobutylene	$C_{12}H_{24}$	503
			Vinyl Acetate	$C_4H_6O_2$	473
	2-Butanone	C_4H_8O	Acetone	C_3H_6O	410–411
			2-Butanol	$C_4H_{10}O$	474
			Cyclohexanone	$C_6H_{10}O$	475
			Toluene	C_7H_8	476
	Butyl Acetate	$C_6H_{12}O_2$	1-Butanol	$C_4H_{10}O$	486
			1-Pentanol	$C_5H_{12}O$	524
	Butylamine	$C_4H_{11}N$	Ethanol	C_2H_6O	360
			Triethylamine	$C_6H_{15}N$	507–508
	Butyraldehyde	C_4H_8O	1-Butanol	$C_4H_{10}O$	478
			Crotonaldehyde	C_4H_6O	471
			Ethanol	C_2H_6O	342
			2-Methylpropanal	C_4H_8O	477

Water	Chloroacetic Acid	$C_2H_3ClO_2$	Nitric Acid	HNO_3	222
	Chloroform	$CHCl_3$	Acetic Acid	$C_2H_4O_2$	227–228
			Acetone	C_3H_6O	229–231
	Cis-Crotonitrile	C_4H_5N	Allylcyanide	C_4H_5N	470
			Allyl Alcohol	C_3H_6O	439
	Crotonaldehyde	C_4H_6O	Acetaldehyde	C_2H_4O	315
			Butyraldehyde	C_4H_8O	471
	Diethyl Ether	C_6H_{12}	2-Butanone	C_4H_8O	475
			Ethanol	C_2H_6O	354–355, 372–379
			Tetrahydrofuran	C_4H_8O	482
			Toluene	C_7H_8	504
	Cyclohexanol	$C_6H_{12}O$	Methanol	CH_4O	301–303
	Cyclohexanone	$C_6H_{10}O$	Methanol	CH_4O	298–300
	Decane	$C_{10}H_{22}$	2-Butanol	$C_4H_{10}O$	497
	Dibuthyl Ether	$C_8H_{18}O$	1-Butanol	$C_4H_{10}O$	488–496
	Diethylene Glycol	$C_4H_{10}O_3$	Methanol	CH_4O	283–286
			n-Methyl-2-Pyrrolidone	C_5H_9NO	506
	Diisopropyl Ether	$C_6H_{14}O$	2-Propanol	C_3H_8O	461–463
	Dimethoxymethane	$C_3H_8O_2$	Methanol	CH_4O	271–274
	Dimethyl Sulfoxide	C_2H_6OS	Tert-Butanol	$C_4H_{10}O$	401
			Monoethanolamine	C_2H_7NO	400
	n,n-Dimethylacetamide	C_4H_9NO	Acetic Acid	$C_2H_4O_2$	325
	n,n-Dimethylaniline	$C_8H_{11}N$	Acetic Acid	$C_2H_4O_2$	327–328
	4,4-Dimethyl-1,3-Dioxane	$C_6H_{12}O_2$	3-Methyl-3-Buten-1-ol	$C_5H_{10}O$	523
	n,n-Dimethylformamide (DMF)	C_3H_7NO	1,4-Dioxane	$C_4H_8O_2$	443–448
			Ethanol	C_2H_6O	333–335

Water	n,n-Dimethylformamide (DMF)	C_3H_7NO	Ethyl Acetate	$C_5H_8O_2$	449–450
			Formic Acid	CH_2O_2	240
			Methanol	CH_4O	269
			1-Propanol	C_3H_8O	441
			2-Propanol	C_3H_8O	442
	1,4-Dioxane	$C_4H_8O_2$	Acetone	C_3H_6O	420
			n,n-Dimethylformamide	C_3H_7NO	443–448
			Ethanol	C_2H_6O	343–344
			Ethyl Acetate	$C_5H_8O_2$	483
			Toluene	C_7H_8	484
	1,3-Dioxolane	$C_3H_6O_2$	Methanol	CH_4O	263–264
	Diphenyl Ether	$C_{12}H_{10}O$	1-Propanol	C_3H_8O	456
	Epichlorohydrin	C_3H_5ClO	2-Propanol	C_3H_8O	406–408
	1,2-Ethanediol	$C_2H_6O_2$	Acetone	C_3H_6O	402
			Acetonitrile	C_2H_3N	310
			Ethanol	C_2H_6O	330
			1,2-Propanediol	$C_3H_8O_2$	403–405
	Ethanol	C_2H_6O	Acetone	C_3H_6O	402
			Acetaldehyde	C_2H_4O	314
			Acetic Acid 3-Methylbutyl Ester	$C_7H_{14}O_2$	387
			Benzene	C_6H_6	366
			1-Butanol	$C_4H_{10}O$	351–352, 356
			Tert-Butanol	$C_4H_{10}O$	359
			Butylamine	$C_4H_{11}N$	360
			Butyraldehyde	C_4H_8O	342

Water	Ethanol	C_2H_6O	Diethyl Ether	C_6H_{12}	354–355
			n,n-Dimethylformamide (DMF)	C_3H_7NO	333–335
			1,4-Dioxane	$C_4H_8O_2$	343–344
			1,2-Ethanediol	$C_2H_6O_2$	330
			Ethyl Acetate	$C_4H_8O_2$	345–350
			Ethylenediamine	$C_2H_8O_2$	331
			Ethyl Formate	$C_3H_6O_2$	332
			1-Ethyl-3-Methyl-1H-Imidazolium Tetrafluoroborate	$C_6H_{11}BF_4N_2$	369–371
			Ethyl Tert-Butyl Ether (ETBE)	$C_6H_{14}O$	382
			Formaldehyde	CH_2O	235
			Glycerol	$C_3H_8O_3$	339–341
			Hexane	C_6H_{14}	381
			Hexanoic Acid Ethyl Ester	$C_8H_{14}O_2$	394
			Hexyl Acetate	$C_8H_{19}O_2$	395–396
			Isobutyl Acetate	$C_6H_{12}O_2$	380
			Methanol	CH_4O	254–260
			Methyl Tert-Amyl Ether (TAME)	$C_6H_{14}O$	383–384
			3-Methyl-1-Butanol	$C_5H_{12}O$	361–363
			Methyl Tert-Butyl Ether (MTBE)	$C_5H_{12}O$	364–365
			n-Methylacetamide	C_3H_7NO	336
			n-Methylformamide	C_2H_5NO	329
			2-Methyl-1-Propanol	$C_4H_{10}O$	357–358
			Nitromethane	CH_3NO_2	242–249
			Octanoic Acid Ethyl Ester	$C_{10}H_{20}O_2$	399
			1-Octanol	$C_8H_{18}O$	397–398

Water	Ethanol	C_2H_6O	Phenol	C_6H_6O	367–368
			1-Propanol	C_3H_8O	337–338
			Tetrachloromethane	CCl_4	224
			Toluene	C_7H_8	386
			Triethylene Glycol	$C_6H_{14}O_4$	385
			o-Xylene	C_8H_{10}	388–389
			m-Xylene	C_8H_{10}	390–391
			p-Xylene	C_8H_{10}	392–393
	2-Ethoxyethanol	$C_4H_{10}O_2$	Tert.Butanol	$C_4H_{10}O$	499
	Ethyl Acetate	$C_4H_8O_2$	Acetone	C_3H_6O	421
			n,n-Dimethylformamide	C_3H_7NO	449–450
			1,4-Dioxane	$C_4H_8O_2$	483
			Ethanol	C_2H_6O	345–350
			Ethyl Formate	$C_3H_6O_2$	440
	Ethyl Tert-Butyl Ether (ETBE)	$C_6H_{14}O$	Ethanol	C_2H_6O	382
	Ethyl Formate	$C_3H_6O_2$	Ethanol	C_2H_6O	332
			Ethyl Acetate	$C_5H_8O_2$	440
	1-Ethyl-3-Methyl-1H-Imidazolium Tetrafluoroborate	$C_6H_{11}BF_4N_2$	Acetic Acid	$C_2H_4O_2$	371
			Ethanol	C_2H_6O	369–370
	Ethylenediamine	$C_2H_8N_2$	Ethanol	C_2H_6O	331
	Formaldehyde	CH_2O	Ethanol	C_2H_6O	235
			Methanol	CH_4O	232–234
			1,3,5-Trioxane	$C_3H_6O_3$	236
	Formic Acid	CH_2O_2	n,n-Dimethylformamide (DMF)	C_3H_7NO	240
			Pentanoic Acid	$C_5H_{10}O_2$	241
			Propionic Acid	$C_3H_6O_2$	237–239

Water	Furfural	$C_5H_4O_2$	Methanol	CH_4O	287
	Glycerol	$C_3H_8O_3$	Ethanol	C_2H_6O	339–341
	Heptane	C_7H_{16}	Nitromethane	CH_3NO_2	252
			1-Propanol	C_3H_8O	455
	Hexane	C_6H_{14}	Acetic Acid	$C_2H_4O_2$	326
			Ethanol	C_2H_6O	381
	Hexanoic Acid Ethyl Ester	$C_8H_{14}O_2$	Ethanol	C_2H_6O	394
	1-Hexene	C_6H_{12}	n-Methyl-2-Pyrrolidone	C_5H_9NO	516–519
	Hexyl Acetate	$C_8H_{14}O_2$	Ethanol	C_2H_6O	395–396
			Methanol	CH_4O	306–307
	Hydrogen Bromide	HBr	Hydrogen Chloride	HCl	217
			Sulfuric Acid	H_2O_4S	218
	Hydrogen Chloride	HCl	Hydrogen Bromide	HBr	217
			Sulfuric Acid	H_2O_4S	219–220
	Isobutyl Acetate	$C_6H_{12}O_2$	Ethanol	C_2H_6O	380
	Isoprene	C_5H_8	Acetonitrile	C_2H_3N	312
	Isopropylbenzene	C_9H_{12}	Acetone	C_3H_6O	436–438
			Phenol	C_6H_6O	527–528
	Methacrylic Acid	$C_4H_6O_2$	Acetic Acid	$C_2H_4O_2$	322
			Methacrylic Acid Methyl Ester	$C_5H_8O_2$	472
	Methacrylic Acid Methyl Ester	$C_5H_8O_2$	Methacrylic Acid	$C_4H_6O_2$	472
			Methanol	CH_4O	288–292
	Methanol	CH_4O	Acetone	C_3H_6O	261–262
			Tert-Butanol	$C_4H_{10}O$	281–282
			Cyclohexanol	$C_6H_{12}O$	301–303
			Cyclohexanone	$C_6H_{10}O$	298–300

Water	Methanol	CH_4O	Diethylene Glycol	$C_4H_{10}O_3$	283–286
			Dimethoxymethane	$C_3H_8O_2$	271–274
			n,n-Dimethylformamide (DMF)	C_3H_7NO	269
			1,3-Dioxolane	$C_3H_6O_2$	263–264
			Ethanol	C_2H_6O	254–260
			Formaldehyde	CH_2O	232–234
			Furfural	$C_5H_4O_2$	287
			Hexyl Acetate	$C_8H_{14}O_2$	306–307
			Methacrylic Acid Methyl Ester	$C_5H_8O_2$	288–292
			n-Methylacetamide	C_3H_7NO	270
			Methyl Acetate	$C_3H_6O_2$	265
			Methyl Tert-Amyl Ether	$C_6H_{14}O$	304–305
			Methyl Tert-Butyl Ether	$C_5H_{12}O$	293–297
			Methyl Butyrate	$C_5H_{10}O_2$	277
			n-Methylformamide	C_2H_5NO	253
			Methyl Methoxyacetate	$C_4H_8O_3$	276
			2-Methyl-1-Propanol	$C_4H_{10}O$	278–280
			1-Octanol	$C_8H_{18}O$	308–309
			Tetrachloromethane	CCl_4	223
			1,3,5-Trioxane	$C_3H_6O_3$	266–268
			Vinyl Acetate	$C_4H_6O_2$	275
	Methyl Acetate	$C_3H_6O_2$	Acetic Acid	$C_2H_4O_2$	319–320
			Methanol	CH_4O	265
	Methyl Tert-Butyl Ether (MTBE)	$C_5H_{12}O$	Tert-Butanol	$C_4H_{10}O$	500–501
			Ethanol	C_2H_6O	364–365
			Methanol	CH_4O	293–297

Water	Ethyl Tert-Butyl Ether (ETBE)	$C_6H_{14}O$	Tert-Butanol	$C_4H_{10}O$	502
	Methyl Butyrate	$C_5H_{10}O_2$	Methanol	CH_4O	277
	3-Methyl Cyclopentene	C_6H_{10}	n-Methyl-2-Pyrrolidone	C_5H_9NO	514–515
	Methyl Methoxyacetate	$C_4H_8O_3$	Methanol	CH_4O	276
	Methyl Tert-Amyl Ether	$C_6H_{14}O$	Ethanol	C_2H_6 O	383–384
			Methanol	CH_4O	304–305
	2-Methyl-1-Propanol	$C_4H_{10}O$	1-Butanol	$C_4H_{10}O$	485, 505
			Ethanol	C_2H_6O	357–358
			Methanol	CH_4O	278–280
	n-Methyl-2-Pyrrolidone	C_5H_9NO	Diethylene Glycol	$C_4H_{10}O_3$	506
			1-Hexene	C_6H_{12}	516–519
			3-Methyl Cyclopentene	C_6H_{10}	514–515
			2-Methylbutane	C_5H_{12}	512–513
			3-Methylpentane	C_6H_{14}	520–521
			1-Pentene	C_5H_{10}	510–511
			Toluene	C_7H_8	522
	3-Methyl-3-Buten-1-ol	$C_5H_{10}O$	4,4-Dimethyl-1,3-Dioxane	$C_6H_{12}O_2$	523
	n-Methylacetamide	C_3H_7NO	Ethanol	C_2H_6O	336
			Methanol	CH_4O	270
	2-Methylbutane	C_5H_{12}	n-Methyl-2-Pyrrolidone	C_5H_9NO	512–513
			2-Propanol	C_3H_8O	460
	3-Methyl-1-Butanol	$C_5H_{12}O$	Ethanol	C_2H_6O	361–363
	2-Methyl-2-Butene	C_5H_{10}	Acetonitrile	C_2H_3N	313
	n-Methylformamide	C_2H_5NO	Ethanol	C_2H_6O	329
			Methanol	CH_4O	253
	3-Methylpentane	C_6H_{14}	n-Methyl-2-Pyrrolidone	C_5H_9NO	520–521

Water	2-Methylpropanal	C_4H_8O	Acetone	C_3H_6O	412–419
			Butyraldehyde	C_4H_8O	477
			2-Methyl-1-Propanol	$C_4H_{10}O$	479
	2-Methyl-1-Propanol	$C_4H_{10}O$	Ethanol	C_2H_6O	357–358
			Methanol	CH_4O	278–280
			2-Methylpropanal	C_4H_8O	479
	3-Methylpyridine	C_6H_7N	Pyridine	C_5H_5N	509
	n-Methyl-2-Pyrrolidone	C_5H_9NO	Diethylene Glycol	$C_4H_{10}O_3$	506
	Monoethanolamine	C_2H_7NO	Dimethyl Sulfoxide	C_2H_6OS	400
	Nitric Acid	HNO_3	Chloroacetic Acid	$C_2H_3ClO_2$	222
			Phosphoric Acid	H_3O_4P	221
	Nitromethane	CH_3NO_2	Ethanol	C_2H_6O	242–249
			Heptane	C_7H_{16}	252
			1-Propanol	C_3H_8O	250–251
	Octane	C_8H_{18}	1-Pentanol	$C_5H_{12}O$	525
	Octanoic Acid Ethyl Ester	$C_{10}H_{20}O_2$	Ethanol	C_2H_6O	399
	1-Octanol	$C_8H_{18}O$	Ethanol	C_2H_6O	397–398
			Methanol	CH_4O	308–309
	Oxazole	C_3H_3NO	Acetonitrile	C_2H_3N	311
	Pentanoic Acid	$C_5H_{10}O_2$	Formic Acid	CH_2O_2	241
	1-Pentanol	$C_5H_{12}O$	1-Propanol	C_3H_8O	453
			Butyl Acetate	$C_6H_{12}O_2$	524
			Octane	C_8H_{18}	525
	1-Pentene	C_5H_{10}	n-Methyl-2-Pyrrolidone	C_5H_9NO	510–511

Water	Phenol	C_6H_6O	Acetone	C_3H_6O	423–434
			Acetophenone	C_8H_8O	526
			Ethanol	C_2H_6O	367–368
			Isopropylbenzene	C_9H_{12}	527–528
	Phosphoric Acid	H_3O_4P	Nitric Acid	HNO_3	221
	1,2-Propanediol	$C_3H_8O_2$	1,2-Ethanediol	$C_2H_6O_2$	403–405
			Toluene	C_7H_8	464–469
	1-Propanol	C_3H_8O	Acetic Acid	$C_2H_4O_2$	321
			Benzene	C_6H_6	454
	1-Propanol	C_3H_8O	n,n-Dimethylformamide (DMF)	C_3H_7NO	441
			Diphenyl Ether	$C_{12}H_{10}O$	456
			Ethanol	C_2H_6O	337–338
			Heptane	C_7H_{16}	455
			Nitromethane	CH_3NO_2	250–251
			Tetrachloromethane	CCl_4	225
			1-Pentanol	$C_5H_{12}O$	453
			2-Propanol	C_3H_8O	451–452
	2-Propanol		Acrylonitrile	C_2H_3N	457
			1-Butanol	$C_4H_{10}O$	458–459
			Diisopropyl Ether	$C_6H_{14}O$	461–463
			n,n-Dimethylformamide (DMF)	C_3H_7NO	442
			Epichlorohydrin	C_3H_5ClO	406–408
			2-Methylbutane	C_5H_{12}	460
			1-Propanol	C_3H_8O	451–452
			Tetrachloromethane	CCl_4	226
	2-Propenoic Acid, Butyl Ester	$C_7H_{12}O_2$	1-Butanol	$C_4H_{10}O$	487

Water	Propionic Acid	$C_3H_6O_2$	Acetic Acid	$C_2H_4O_2$	318
			Formic Acid	CH_2O_2	237–239
	Pyridine	C_5H_5N	3-Methylpyridine	C_6H_7N	509
	Sulfuric Acid	H_2O_4S	Hydrogen Bromide	HBr	218
			Hydrogen Chloride	HCl	219–220
	Tert-Butanol	$C_4H_{10}O$	Dimethyl Sulfoxide	C_2H_6OS	401
			Ethanol	C_2H_6O	359
			2-Ethoxyethanol	$C_4H_{10}O_2$	499
			Ethyl Tert-Butyl Ether (ETBE)	$C_6H_{14}O$	502
			Methanol	CH_4O	281–282
			Methyl Tert-Butyl Ether (MTBE)	$C_5H_{12}O$	500–501
			Vinyl Acetate	$C_4H_6O_2$	473
	Tetrachloromethane	CCl_4	Ethanol	C_2H_6O	224
			Methanol	CH_4O	223
			1-Propanol	C_3H_8O	225
			2-Propanol	C_3H_8O	226
	Tetrahydrofuran	C_4H_8O	1,4-Butanediol	$C_4H_{10}O_2$	480–481
			Cyclohexane	C_6H_{12}	482
	Toluene	C_7H_8	Acetone	C_3H_6O	435
			2-Butanone	C_4H_8O	476
			Diethyl Ether	C_6H_{12}	504
			1,4-Dioxane	$C_4H_8O_2$	484
			Ethanol	C_2H_6O	386
			n-Methyl-2-Pyrrolidone	C_5H_9NO	522
			1,2-Propanediol	$C_3H_8O_2$	464–469
	Triethylamine	$C_6H_{15}N$	Butylamine	$C_4H_{11}N$	507–508

Water	Triethylene Glycol	$C_6H_{14}O_4$	Ethanol	C_2H_6O	385
	Triisobutylene	$C_{12}H_{24}$	2-Butanol	$C_4H_{10}O$	498, 503
	1,3,5-Trioxane	$C_3H_6O_3$	Formaldehyde	CH_2O	236
			Methanol	CH_4O	266–268
	Vinyl Acetate	$C_4H_6O_2$	Acetaldehyde	C_2H_4O	316
			Acetic Acid	$C_2H_4O_2$	323
			Acetone	C_3H_6O	409
			Methanol	CH_4O	275
			Tert-Butanol	$C_4H_{10}O$	473
	o-Xylene	C_8H_{10}	Ethanol	C_2H_6O	388–389
	m-Xylene	C_8H_{10}	Ethanol	C_2H_6O	390–391
	p-Xylene	C_8H_{10}	Ethanol	C_2H_6O	392–393

H_2O	CH_2O	Formaldehyde	CH_4O	Methanol	$C_3H_6O_3$	1,3,5-Trioxane	529–530
	CH_2O_2	Formic Acid	$C_2H_4O_2$	Acetic Acid	$C_3H_6O_2$	Methyl Acetate	531
						Propionic Acid	532–533
	CH_4O	Methanol	$C_3H_6O_2$	Methyl Acetate	$C_2H_4O_2$	Acetic Acid	534
			$C_3H_6O_3$	1,3,5-Trioxane	CH_2O	Formaldehyde	529–530
			C_3H_8O	1-Propanol	C_2H_6O	Ethanol	535
					$C_4H_{10}O$	2-Methyl-1-Propanol	542
				2-Propanol	C_3H_6O	Acetone	541
			$C_5H_4O_2$	Furfural	C_2H_6O	Ethanol	536–537
			$C_5H_{10}O$	3-Methylbutyraldehyde	C_2H_6O	Ethanol	538–540
	$C_2H_4O_2$	Acetic Acid	CH_4O	Methanol	$C_3H_6O_2$	Methyl Acetate	534
			C_2H_6O	Ethanol	$C_4H_8O_2$	Ethyl Acetate	543–545
			$C_3H_6O_2$	Methyl Acetate	CH_2O_2	Formic Acid	531
				Propionic Acid	CH_2O_2	Formic Acid	532–533
			C_3H_8O	1-Propanol		Propyl Acetate	546–548
				2-Propanol	$C_5H_{10}O_2$	Isopropyl Acetate	549–553
	C_2H_6O	Ethanol	CH_4O	Methanol	C_3H_8O	1-Propanol	535
					$C_5H_4O_2$	Furfural	536–537
					$C_5H_{10}O$	3-Methylbutyraldehyde	538–540
			C_2H_6O	Acetone	$C_4H_8O_2$	Ethyl Acetate	554–555
			$C_4H_8O_2$	Ethyl Acetate	$C_2H_4O_2$	Acetic Acid	543–545
			$C_4H_{10}O$	2-Methyl-1-Propanol	$C_5H_{12}O$	2-Methyl-1-Butanol	558–561
				Tert-Butanol	$C_6H_{14}O$	Ethyl Tert-Butyl Ether (ETBE)	562
			$C_5H_4O_2$	Furfural	C_3H_8O	1-Propanol	556–557
H_2O	C_3H_6O	Acetone	CH_4O	Methanol	C_3H_8O	2-Propanol	541
			$C_4H_8O_2$	Ethyl Acetate	C_2H_6O	Ethanol	554–555

H_2O	C_3H_6O	Acetone	C_6H_6O	Phenol	C_9H_{12}	Isopropylbenzene	563–565
	$C_3H_6O_2$	Methyl Acetate	$C_2H_4O_2$	Acetic Acid	CH_4O	Methanol	534
			CH_2O_2	Formic Acid	$C_2H_4O_2$	Acetic Acid	531
		Propionic Acid	CH_2O_2	Formic Acid	$C_2H_4O_2$	Acetic Acid	532–533
	$C_3H_6O_3$	1,3,5-Trioxane	CH_2O	Formaldehyde	CH_4O	Methanol	529–530
	C_3H_8O	1-Propanol	C_2H_6O	Ethanol	CH_4O	Methanol	535
					$C_5H_4O_2$	Furfural	556–557
			$C_4H_{10}O$	2-Methyl-1-Propanol	$C_5H_{12}O$	2-Methyl-1-Butanol	566–569
					CH_4O	Methanol	542
			$C_5H_{10}O_2$	Propyl Acetate	$C_2H_4O_2$	Acetic Acid	546–548
		2-Propanol	C_3H_6O	Acetone	CH_4O	Methanol	541
			$C_5H_{10}O_2$	Isopropyl Acetate	$C_2H_4O_2$	Acetic Acid	549–553
	$C_4H_8O_2$	Ethyl Acetate	$C_2H_4O_2$	Acetic Acid	C_2H_6O	Ethanol	543–545
			C_2H_6O	Ethanol	C_2H_6O	Acetone	554–555
	$C_4H_{10}O$	2-Methyl-1-Propanol	CH_4O	Methanol	C_3H_8O	1-Propanol	542
			$C_5H_{12}O$	2-Methyl-1-Butanol	C_2H_6O	Ethanol	558–561
					C_3H_8O	1-Propanol	566–569
		Tert-Butanol	$C_6H_{14}O$	Ethyl Tert-Butyl Ether	C_2H_6O	Ethanol	562
	$C_5H_4O_2$	Furfural	C_2H_6O	Ethanol	CH_4O	Methanol	536–537
			C_3H_8O	1-Propanol	C_2H_6O	Ethanol	556–557
	$C_5H_{10}O$	3-Methylbutyraldehyde	C_2H_6O	Ethanol	CH_4O	Methanol	538–540
	$C_5H_{10}O_2$	Isopropyl Acetate	$C_2H_4O_2$	Acetic Acid	C_3H_8O	2-Propanol	549–553
		Propyl Acetate	$C_2H_4O_2$	Acetic Acid	C_3H_8O	1-Propanol	546–548
	$C_5H_{12}O$	2-Methyl-1-Butanol	C_2H_6O	Ethanol	$C_4H_{10}O$	2-Methyl-1-Propanol	558–561
			C_3H_8O	1-Propanol	$C_4H_{10}O$	2-Methyl-1-Propanol	566–569

H_2O	C_6H_6O	Phenol	C_9H_{12}	Isopropylbenzene	C_3H_6O	Acetone	563–565
	$C_6H_{14}O$	Ethyl Tert-Butyl Ether	C_2H_6O	Ethanol	$C_4H_{10}O$	Tert-Butanol	562
	C_9H_{12}	Isopropylbenzene	C_3H_6O	Acetone	C_6H_6O	Phenol	563–565

Water	Acetic Acid	$C_2H_4O_2$	Ethanol	C_2H_6O	Ethyl Acetate	$C_4H_8O_2$	543–545
			Methanol	CH_4O	Methyl Acetate	$C_3H_6O_2$	534
			Methyl Acetate	$C_3H_6O_2$	Formic Acid	CH_2O_2	531
			1-Propanol	C_3H_8O	Propyl Acetate	$C_5H_{10}O_2$	546–548
			2-Propanol		Isopropyl Acetate	$C_5H_{10}O_2$	549–553
			Propionic Acid	$C_3H_6O_2$	Formic Acid	CH_2O_2	532–533
	Acetone	C_3H_6O	Ethyl Acetate	$C_4H_8O_2$	Ethanol	C_2H_6O	554–555
			Methanol	CH_4O	2-Propanol	C_3H_8O	541
			Phenol	C_6H_6O	Isopropylbenzene	C_9H_{12}	563–565
	Tert-Butanol	$C_4H_{10}O$	Ethyl Tert-Butyl Ether	$C_6H_{14}O$	Ethanol	C_2H_6O	562
	Ethanol	C_2H_6O	Acetone	C_2H_6O	Ethyl Acetate	$C_4H_8O_2$	554–555
			Tert-Butanol	$C_4H_{10}O$	Ethyl Tert-Butyl Ether	$C_6H_{14}O$	562
			Ethyl Acetate	$C_4H_8O_2$	Acetic Acid	$C_2H_4O_2$	543–545
			Furfural	$C_5H_4O_2$	1-Propanol	C_3H_8O	556–557
			Methanol	CH_4O	Furfural	$C_5H_4O_2$	536–537
					3-Methylbutyraldehyde	$C_5H_{10}O$	538–540
					1-Propanol	C_3H_8O	535
			2-Methyl-1-Propanol	$C_4H_{10}O$	2-Methyl-1-Butanol	$C_5H_{12}O$	558–561
	Ethyl Acetate	$C_4H_8O_2$	Acetic Acid	$C_2H_4O_2$	Ethanol	C_2H_6O	543–545
			Ethanol	C_2H_6O	Acetone	C_2H_6O	554–555
	Ethyl Tert-Butyl Ether (ETBE)	$C_6H_{14}O$	Ethanol	C_2H_6O	Tert-Butanol	$C_4H_{10}O$	562
	Formaldehyde	CH_2O	Methanol	CH_4O	1,3,5-Trioxane	$C_3H_6O_3$	529–530
	Formic Acid	CH_2O_2	Acetic Acid	$C_2H_4O_2$	Methyl Acetate	$C_3H_6O_2$	531
					Propionic Acid	$C_3H_6O_2$	532–533

Water	Furfural	$C_5H_4O_2$	Ethanol	C_2H_6O	Methanol	CH_4O	536–537
			1-Propanol	C_3H_8O	Ethanol	C_2H_6O	556–557
	Isopropyl Acetate	$C_5H_{10}O_2$	Acetic Acid	$C_2H_4O_2$	2-Propanol	C_3H_8O	549–553
	Isopropylbenzene	C_9H_{12}	Acetone	C_3H_6O	Phenol	C_6H_6O	563–565
	Methanol	CH_4O	Furfural	$C_5H_4O_2$	Ethanol	C_2H_6O	536–537
			Methyl Acetate	$C_3H_6O_2$	Acetic Acid	$C_2H_4O_2$	534
			3-Methylbutyraldehyde	$C_5H_{10}O$	Ethanol	C_2H_6O	538–540
			1-Propanol	C_2H_8O	Ethanol	C_2H_6O	535
					2-Methyl-1-Propanol	$C_4H_{10}O$	542
			2-Propanol	C_3H_8O	Acetone	C_3H_6O	541
			1,3,5-Trioxane	$C_3H_6O_3$	Formaldehyde	CH_2O	529–530
	Methyl Acetate	$C_3H_6O_2$	Acetic Acid	$C_2H_4O_2$	Methanol	CH_4O	534
			Formic Acid	CH_2O_2	Acetic Acid	$C_2H_4O_2$	531
	2-Methyl-1-Butanol	$C_5H_{12}O$	Ethanol	C_2H_6O	2-Methyl-1-Propanol	$C_4H_{10}O$	558–561
			1-Propanol	C_3H_8O	2-Methyl-1-Propanol	$C_4H_{10}O$	566–569
	3-Methylbutyraldehyde	$C_5H_{10}O$	Ethanol	C_2H_6O	Methanol	CH_4O	538–540
	2-Methyl-1-Propanol	$C_4H_{10}O$	2-Methyl-1-Butanol	$C_5H_{12}O$	Ethanol	C_2H_6O	558–561
					1-Propanol	C_3H_8O	566–569
			Methanol	CH_4O	1-Propanol	C_3H_8O	542
	Phenol	C_6H_6O	Isopropylbenzene	C_9H_{12}	Acetone	C_3H_6O	563–565
	1-Propanol	C_3H_8O	Ethanol	C_2H_6O	Methanol	CH_4O	535
					Furfural	$C_5H_4O_2$	556–557
			2-Methyl-1-Propanol	$C_4H_{10}O$	2-Methyl-1-Butanol	$C_5H_{12}O$	566–569
					Methanol	CH_4O	542
			Propyl Acetate	$C_5H_{10}O_2$	Acetic Acid	$C_2H_4O_2$	546–548

Water	2-Propanol	C_3H_8O	Acetone	C_3H_6O	Methanol	CH_4O	541
			Isopropyl Acetate	$C_5H_{10}O_2$	Acetic Acid	$C_2H_4O_2$	549–553
	Propionic Acid	$C_3H_6O_2$	Formic Acid	CH_2O_2	Acetic Acid	$C_2H_4O_2$	532–533
	Propyl Acetate	$C_5H_{10}O_2$	Acetic Acid	$C_2H_4O_2$	1-Propanol	C_3H_8O	546–548
	1,3,5-Trioxane	$C_3H_6O_3$	Formaldehyde	CH_2O	Methanol	CH_4O	529–530