Section 8

Miscellaneous solvents

Dimethylformamide

Alternative names
DMF

Reference codes

CAS number	68 12 2	Hazchem code	2P
UN number	2265	EPA code	

Physical properties

Molecular weight	73	Cubic expansion coeff (per °C × 10^3)	1.03
Empirical formula	$C_3H_7N_1O_1$	Surface tension (@20°C dyn/cm)	35
Boiling point (°C)	153	Absolute viscosity (@25°C cP)	0.82
Freezing point (°C)	–61	Refractive index (25°C)	1.427
Specific gravity (20/4)	0.945		

Fire hazards

Flash point (closed cup °C)	62	Lower explosive limit (ppm)	22000
Autoignition temperature (°C)	445	Upper explosive limit (ppm)	160000
Electrical conductivity	6.0E–8		

Health hazards

IDLH (ppm)	3500	Vapour concentration @21°C ppm	3700
OES-TWA	10	Vapour density (relative to air)	2.53
OES-STEL	20	Vapour pressure @21°C mmHg	3.8
Odour threshold (ppm)	100	POCP	

Aqueous effluent

Solubility in water (25°C %w/w)		Total
Solubility of water in (25°C %w/w)		Total
Log_{10} activated carbon partition		
Log_{10} partition in octanol/water (w/w)		–0.74
Biological oxygen demand w/w (days)		0.9
Theoretical oxygen demand w/w		1.86

Vapour pressure equation constants (Log_{10}, mmHg)

Antoine equation	A	7.10850
	B	1537.78
	C	210.390
Cox chart	A	
	B	

Solvent properties

Solubility parameter	12.1	Kauri butanol value	
Dipole (D)	3.8	Evaporation time (ether = 1)	120
Dielectric constant (20°C)	36.7	Evaporation time (BuAc = 1)	0.17
Polarity (water 100)	40.4		

Thermal information

Latent heat (cal/mol)	10074
Nett heat of combustion (kcal/gmol)	423
Specific heat (cal/mol/°C)	36
Critical pressure (MN/m^2)	4.48
Critical temperature (K)	647
Latent heat of fusion (cal/mol)	
Van der Waals' volume	3.09
Van der Waals' surface area	2.74
Molar volume	77.43

Solute	Azeotrope X% w/w	Azeotrope °C	Reference	Solute γ^{∞}	Reference	Partition coefficient	Reference
Hydrocarbons							
n-Pentane				12.8	1x/1/58		
n-Hexane				17.2	6c/332		
n-Heptane	5	97		8.3	6x/98		
n-Octane				18.6	1x/1/61		
n-Nonane				22.0	1x/3/1005		
n-Decane				25.3	1x/3/1005		
2,2,4-TMP				30.1	1x/1/61		
Cyclohexane				5.4	1x/1/59		
Benzene	None		5893	1.2	1x/1/59		
Toluene	None		5893a	2.0	1x/1/60		
Ethylbenzene	15	134		2.2	1x/3/1003		
Xylenes	20	136	5894	2.7	7/481		
C_9 Aromatics							
Tetralin							
Alcohols							
Methanol	None			0.6	2a/115		
Ethanol	None			0.6	2c/371		
n-Propanol							
i-Propanol							
n-Butanol							
i-Butanol							
s-Butanol							
n-Amyl alc.							
i-Amyl alc.							
Cyclohexanol							
1-Octanol				1.2	2f/527		
Ethanediol				1.0	2b/8		
DEG							
1,2-Propanediol							
Glycol ethers							
PGME							
EGME							
EEE							
EGBE							
Chlorinated							
MDC				0.9	8/265	0.4	
Chloroform					0.29		
Carbon tet.				1.8	8/117		
1,2-EDC							
1,1,1-TCA							
TCE						0.04	
Perk.						0.02	
MCB							

Miscellaneous solvents

Solute	Azeotrope X% w/w	°C	Reference	Solute γ^{∞}	Reference	Partition coefficient	Reference
Ketones							
Acetone				0.9	3+4/164		
MEK				1.3	3b/289		
MIBK							
Cyclohexanone				1.2	3b/500		
NMP							
Acetophenone							
Ethers							
Diethyl ether							
DIPE							
Dibutyl ether							
MTBE							
1,4-Dioxane				1.3	3+4/454		
THF							
Esters							
Me acetate				1.6	1x/3/999		
Et acetate							
i-Propyl acetate							
n-Butyl acetate							
Cellosolve acetate							
Miscellaneous							
DMF	–		–	–	–	–	–
DMAc							
DMSO				1.2	8/407		
Sulfolane							
CS_2				4.4	1x/1/57		
Acetic acid							
Aniline	Azeo						
Nitrobenzene							
Morpholine							
Pyridine							
2-Nitropropane							
Acetonitrile	None		2765	0.3	8/428		
Furfuraldehyde							
Phenol							
Water	None			1.08	1/276		

Dimethylacetamide

Alternative names
DMAc

Reference codes

CAS number	127 19 5	Hazchem code	
UN number		EPA code	

Physical properties

Molecular weight	87	Cubic expansion coeff (per °C × 10^3)	0.95
Empirical formula	$C_4H_9N_1O_1$	Surface tension (@20°C dyn/cm)	34
Boiling point (°C)	166	Absolute viscosity (@25°C cP)	0.92
Freezing point (°C)	–20	Refractive index (25°C)	1.436
Specific gravity (20/4)	0.945		

Fire hazards

Flash point (closed cup °C)	70	Lower explosive limit (ppm)	15000
Autoignition temperature (°C)	491	Upper explosive limit (ppm)	115000
Electrical conductivity			

Health hazards

IDLH (ppm)	400	Vapour concentration @21°C ppm	1316
OES-TWA	10	Vapour density (relative to air)	3.02
OES-STEL	20	Vapour pressure @21°C mmHg	1.0
Odour threshold (ppm)	50	POCP	

Aqueous effluent

Solubility in water (25°C %w/w)		Total
Solubility of water in (25°C %w/w)		Total
Log_{10} activated carbon partition		
Log_{10} partition in octanol/water (w/w)		–0.77
Biological oxygen demand w/w (days)		
Theoretical oxygen demand w/w		

Vapour pressure equation constants (Log_{10}, mmHg)

Antoine equation	A	7.76228
	B	1889.1
	C	221.00
Cox chart	A	
	B	

Solvent properties

Solubility parameter	11.0	Kauri butanol value	
Dipole (D)	3.8	Evaporation time (ether = 1)	172
Dielectric constant (20°C)	37.8	Evaporation time (BuAc = 1)	0.14
Polarity (water 100)	40.1		

Thermal information

Latent heat (cal/mol)	10360
Nett heat of combustion (kcal/gmol)	569
Specific heat (cal/mol/°C)	42
Critical pressure (MN/m^2)	4.08
Critical temperature (K)	658
Latent heat of fusion (cal/mol)	
Van der Waals' volume	3.53
Van der Waals' surface area	2.97
Molar volume	92.1

Solute	Azeotrope X% w/w	°C	Reference	Solute γ^{∞}	Reference	Partition coefficient	Reference
Hydrocarbons							
n-Pentane				8.3	1x/1/118		
n-Hexane				17.0	1x/1/118		
n-Heptane				20.0	1x/1/118		
n-Octane				13.0	1x/3/1168		
n-Nonane							
n-Decane							
2,2,4-TMP							
Cyclohexane							
Benzene				2.3	1x/1/118		
Toluene				3.0	1x/1/118		
Ethylbenzene				1.6	1x/3/1168		
Xylenes				1.6	1x/3/1168		
C_9 Aromatics							
Tetralin							
Alcohols							
Methanol				0.5	1x/3/1065		
Ethanol				0.5	1x/3/1068		
n-Propanol				0.3	2e/454		
i-Propanol							
n-Butanol							
i-Butanol							
s-Butanol							
n-Amyl alc.							
i-Amyl alc.							
Cyclohexanol							
1-Octanol							
Ethanediol							
DEG							
1,2-Propanediol							
Glycol ethers							
PGME							
EGME							
EEE							
EGBE							
Chlorinated							
MDC							
Chloroform							
Carbon tet.							
1,2-EDC							
1,1,1-TCA							
TCE							
Perk.							
MCB							

Miscellaneous solvents

Solute	Azeotrope X% w/w	°C	Reference	Solute γ^{∞}	Reference	Partition coefficient	Reference
Ketones							
Acetone				1.1	1x/3/1168		
MEK				1.1	1x/3/1168		
MIBK							
Cyclohexanone							
NMP							
Acetophenone							
Ethers							
Diethyl ether							
DIPE							
Dibutyl ether							
MTBE							
1,4-Dioxane				1.2	1x/3/1168		
THF							
Esters							
Me acetate				1.3	1x/3/1168		
Et acetate				1.3	1x/3/1168		
i-Propyl acetate							
n-Butyl acetate							
Cellosolve acetate							
Miscellaneous							
DMF							
DMAc	–		–	–	–	–	–
DMSO							
Sulfolane							
CS_2							
Acetic acid	79	171	3133	0.2	5/115		
Aniline							
Nitrobenzene							
Morpholine							
Pyridine							
2-Nitropropane							
Acetonitrile							
Furfuraldehyde							
Phenol							
Water	None			1.0	1a/402		

Dimethylsulphoxide

Alternative names
DMSO, sulfinyl-bis-methane, DIMSO

Reference codes			
CAS number	67 68 5	Hazchem code	
UN number		EPA code	
Physical properties			
Molecular weight	78	Cubic expansion coeff (per °C × 10^3)	1.0
Empirical formula	$C_2H_6O_1S_1$	Surface tension (@20°C dyn/cm)	43.7
Boiling point (°C)	189	Absolute viscosity (@25°C cP)	2.0
Freezing point (°C)	+18.5	Refractive index (25°C)	1.476
Specific gravity (20/4)	1.101		
Fire hazards			
Flash point (closed cup °C)	95	Lower explosive limit (ppm)	30000
Autoignition temperature (°C)	255	Upper explosive limit (ppm)	420000
Electrical conductivity	2E–9		
Health hazards			
IDLH (ppm)	1000	Vapour concentration @21°C ppm	650
OES-TWA		Vapour density (relative to air)	2.7
OES-STEL		Vapour pressure @21°C mmHg	0.7
Odour threshold (ppm)		POCP	
Aqueous effluent			
Solubility in water (25°C %w/w)		Total	
Solubility of water in (25°C %w/w)		Total	
Log_{10} activated carbon partition			
Log_{10} partition in octanol/water (w/w)			
Biological oxygen demand w/w (days)			
Theoretical oxygen demand w/w			
Vapour pressure equation constants (Log_{10}, mmHg)			
Antoine equation	A	6.88076	
	B	1541.52	
	C	191.797	
Cox chart	A		
	B		
Solvent properties			
Solubility parameter	13.0	Kauri butanol value	
Dipole (D)	3.96	Evaporation time (ether = 1)	1500
Dielectric constant (20°C)	46.6	Evaporation time (BuAc = 1)	
Polarity (water 100)	44.4		
Thermal information			
Latent heat (cal/mol)	12636		
Nett heat of combustion (kcal/gmol)	441		
Specific heat (cal/mol/°C)	36		
Critical pressure (MN/m^2)			
Critical temperature (K)			
Latent heat of fusion (cal/mol)	3221		
Van der Waals' volume	2.83		
Van der Waals' surface area	2.47		
Molar volume	71.3		

Solute	Azeotrope X% w/w	°C	Reference	Solute γ^{∞}	Reference	Partition coefficient	Reference
Hydrocarbons							
n-Pentane				25.9	1x/1/29		
n-Hexane				38.6	1x/1/30		
n-Heptane				33.4	1x/1/31		
n-Octane				43.5	1x/1/31		
n-Nonane				55.9	1x/1/31		
n-Decane				70.7	1x/1/32		
2,2,4-TMP				61.2	1x/1/31		
Cyclohexane				15.5	1x/1/30		
Benzene	None		4184	2.7	7/169		
Toluene				4.1	7/386		
Ethylbenzene				4.6	1x/1/31		
Xylenes				7.5	1x/3/969		
C_9 Aromatics							
Tetralin							
Alcohols							
Methanol				0.4	2c/62		
Ethanol				0.8	1x/3/967		
n-Propanol							
i-Propanol				1.5	2f/39		
n-Butanol	None		4183a	0.7	2f/131		
i-Butanol	None			0.9	2b/275		
s-Butanol							
n-Amyl alc.							
i-Amyl alc.							
Cyclohexanol							
1-Octanol							
Ethanediol	None			0.2	2b/7		
DEG							
1,2-Propanediol							
Glycol ethers							
PGME							
EGME							
EEE							
EGBE							
Chlorinated							
MDC	None			0.6	8/264		
Chloroform	None			0.7	8/229		
Carbon tet.	None			4.0	8/107		
1,2-EDC							
1,1,1-TCA							
TCE							
Perk.							
MCB							

Solute	Azeotrope X% w/w	°C	Reference	Solute γ^{∞}	Reference	Partition coefficient	Reference
Ketones							
Acetone	None			1.8	3b/80		
MEK				2.5	1x/3/967		
MIBK							
Cyclohexanone							
NMP							
Acetophenone							
Ethers							
Diethyl ether							
DIPE							
Dibutyl ether							
MTBE							
1,4-Dioxane	None			1.5	3+4/450		
THF	None			2.5	3+4/433		
Esters							
Me acetate				3.2	1x/3/967		
Et acetate				3.3	5/461		
i-Propyl acetate							
n-Butyl acetate							
Cellosolve acetate							
Miscellaneous							
DMF	None			1.1	8/407		
DMAc							
DMSO	–		–	–	–	–	–
Sulfolane							
CS_2							
Acetic acid							
Aniline							
Nitrobenzene							
Morpholine							
Pyridine							
2-Nitropropane							
Acetonitrile							
Furfuraldehyde							
Phenol							
Water	None		243	0.5	1/119		

Sulfolane

Alternative names
(Cyclo)tetramethylene sulphone, thiolane-1,1-dioxide

Reference codes

CAS number	126 33 0	Hazchem code	
UN number		EPA code	

Physical properties

Molecular weight	120	Cubic expansion coeff (per °C × 10^3)	0.7
Empirical formula	$C_4H_8O_2S$	Surface tension (@30°C dyn/cm)	35.5
Boiling point (°C)	285	Absolute viscosity (@30°C cP)	10.3
Freezing point (°C)	+27.4	Refractive index (30°C)	1.471
Specific gravity (20/4)	1.26		

Fire hazards

Flash point (closed cup °C)	177	Lower explosive limit (ppm)	54000
Autoignition temperature (°C)		Upper explosive limit (ppm)	
Electrical conductivity			

Health hazards

IDLH (ppm)		Vapour concentration @21°C ppm	65.8
OES-TWA		Vapour density (relative to air)	4.17
OES-STEL		Vapour pressure @21°C mmHg	0.05
Odour threshold (ppm)		POCP	

Aqueous effluent

Solubility in water (25°C %w/w)		Total	
Solubility of water in (25°C %w/w)		Total	
Log_{10} activated carbon partition			
Log_{10} partition in octanol/water (w/w)			
Biological oxygen demand w/w (days)			
Theoretical oxygen demand w/w			

Vapour pressure equation constants (Log_{10}, mmHg)

Antoine equation	A	7.40800
	B	2255.469
	C	211.393
Cox chart	A	
	B	

Solvent properties

Solubility parameter		Kauri butanol value	
Dipole (D)	4.69	Evaporation time (ether = 1)	
Dielectric constant (20°C)	44	Evaporation time (BuAc = 1)	
Polarity (water 100)	41		

Thermal information

Latent heat (cal/mol)	14720
Nett heat of combustion (kcal/gmol)	595
Specific heat (cal/mol/°C)	55
Critical pressure (MN/m^2)	5.32
Critical temperature (K)	801
Latent heat of fusion (cal/mol)	1063
Van der Waals' volume	4.04
Van der Waals' surface area	3.20
Molar volume	95.3

Solute	Azeotrope X% w/w	Azeotrope °C	Azeotrope Reference	Solute γ^{∞}	Reference	Partition coefficient	Reference
Hydrocarbons							
n-Pentane				33.2	1x/1/109		
n-Hexane				48.2	1x/1/111		
n-Heptane	Azeo			51.4	1x/1/112		
n-Octane				66.0	1x/1/113		
n-Nonane				87.3	1x/1/114		
n-Decane				115.0	1x/1/114		
2,2,4-TMP				53.2	1x/1/113		
Cyclohexane				19.3	1x/1/110		
Benzene				2.7	7/191		
Toluene	Azeo			1.5	7/399		
Ethylbenzene				4.9	1x/1/112		
Xylenes				5.1	1x/1/112		
C_9 Aromatics				6.7	1x/3/1063		
Tetralin							
Alcohols							
Methanol				0.8	2c/125		
Ethanol				3.3	2c/344		
n-Propanol				3.5	1x/3/1054		
i-Propanol				4.9	2d/53		
n-Butanol				4.6	1x/3/1055		
i-Butanol				4.3	1x/3/1055		
s-Butanol							
n-Amyl alc.							
i-Amyl alc.							
Cyclohexanol							
1-Octanol							
Ethanediol							
DEG							
1,2-Propanediol							
Glycol ethers							
PGME							
EGME				1.7	2f/103		
EEE							
EGBE							
Chlorinated							
MDC	None			0.9	8/266		
Chloroform				1.1	1x/3/1053		
Carbon tet.				5.0	1x/3/1053		
1,2-EDC				1.3	1x/3/1053		
1,1,1-TCA							
TCE							
Perk.							
MCB							

Miscellaneous solvents

Solute	Azeotrope X% w/w	°C	Reference	Solute γ^{∞}	Reference	Partition coefficient	Reference
Ketones							
Acetone				1.5	1x/3/1054		
MEK				2.1	1x/3/1055		
MIBK				3.7	1x/3/1058		
Cyclohexanone							
NMP							
Acetophenone							
Ethers							
Diethyl ether							
DIPE							
Dibutyl ether							
MTBE							
1,4-Dioxane				3.3	1x/3/1055		
THF							
Esters							
Me acetate				1.7	1x/3/1054		
Et acetate				2.8	1x/3/1055		
i-Propyl acetate							
n-Butyl acetate							
Cellosolve acetate							
Miscellaneous							
DMF							
DMAc							
DMSO							
Sulfolane	–		–	–	–	–	–
CS_2							
Acetic acid							
Aniline							
Nitrobenzene							
Morpholine							
Pyridine							
2-Nitropropane							
Acetonitrile							
Furfuraldehyde							
Phenol							
Water	None			2.1	1x/3/1065		

Carbon disulphide

Alternative names
Carbon bisulphide

Reference codes

CAS number	75 15 0	Hazchem code	
UN number	1131	EPA code	P022

Physical properties

Molecular weight	76	Cubic expansion coeff (per °C × 10^3)	1.4
Empirical formula	C_1S_2	Surface tension (@20°C dyn/cm)	32
Boiling point (°C)	46	Absolute viscosity (@25°C cP)	0.36
Freezing point (°C)	–111	Refractive index (25°C)	1.628
Specific gravity (20/4)	1.26		

Fire hazards

Flash point (closed cup °C)	–30	Lower explosive limit (ppm)	13000
Autoignition temperature (°C)	102	Upper explosive limit (ppm)	500000
Electrical conductivity	1.0E–16		

Health hazards

Idlh (ppm)	500	vapour concentration @21°c ppm	685000
OES-TWA	10	Vapour density (relative to air)	2.7
OES-STEL		Vapour pressure @21°C mmHg	309
Odour threshold (ppm)	0.2	POCP	

Aqueous effluent

Solubility in water (25°C %w/w)		0.21
Solubility of water in (25°C %w/w)		0.014
Log_{10} activated carbon partition		
Log_{10} partition in octanol/water (w/w)		2.0
Biological oxygen demand w/w (days)		
Theoretical oxygen demand w/w		

Vapour pressure equation constants (Log_{10}, mmHg)

Antoine equation	A	6.94279
	B	1169.11
	C	241.59
Cox chart	A	
	B	

Solvent properties

Solubility parameter	10.0	Kauri butanol value	
Dipole (D)	0	Evaporation time (ether = 1)	1.8
Dielectric constant (20°C)	2.64	Evaporation time (BuAc = 1)	10.9
Polarity (water 100)	6.5		

Thermal information

Latent heat (cal/mol)	6460
Nett heat of combustion (kcal/gmol)	246
Specific heat (cal/mol/°C)	18
Critical pressure (MN/m^2)	7.62
Critical temperature (K)	546
Latent heat of fusion (cal/mol)	1050
Van der Waals' volume	2.06
Van der Waals' surface area	1.65
Molar volume	60.65

Solute	Azeotrope X% w/w	Azeotrope °C	Azeotrope Reference	Solute γ^{∞}	Reference	Partition coefficient	Reference
Hydrocarbons							
n-Pentane	11	36	1256				
n-Hexane	None		1274				
n-Heptane	None		1278				
n-Octane				2.0	1x/3/938		
n-Nonane							
n-Decane				1.5	6c/571		
2,2,4-TMP							
Cyclohexane	None		1269	0.4	6a/154		
Benzene	None		1265	1.4	7/100		
Toluene	None		1276	1.1	7/361		
Ethylbenzene							
Xylenes							
C_9 Aromatics							
Tetralin							
Alcohols							
Methanol	71	40	1175	6.3	2a/35		
Ethanol	91	43	1189	84.4	2a/281	16.4	P385
n-Propanol	95	46	1209	13.7	2c/417		
i-Propanol	92	44	1208				
n-Butanol	None		1233	11.3	2f/120		
i-Butanol	None		1236				
s-Butanol	None		1260	24.8	2d/239		
n-Amyl alc.	None		1257	8.7	2f/371		
i-Amyl alc.							
Cyclohexanol							
1-Octanol							
Ethanediol							
DEG							
1,2-Propanediol							
Glycol ethers							
PGME							
EGME							
EEE							
EGBE							
Chlorinated							
MDC	35	36	1170				
Chloroform	None		1169	1.4	8/214		
Carbon tet.	None		1085	1.4	8/76		
1,2-EDC							
1,1,1-TCA							
TCE							
Perk.				1.7	8/318		
MCB							

Miscellaneous solvents

Solute	Azeotrope X% w/w	Azeotrope °C	Azeotrope Reference	Solute γ^{∞}	Reference	Partition coefficient	Reference
Ketones							
Acetone	67	39	1194	7.0	3+4/132	0.78	P506
MEK	84	46	1216	4.4	1x/3/938		
MIBK	None		1272				
Cyclohexanone							
NMP							
Acetophenone							
Ethers							
Diethyl ether	13	34	1235	2.0	3+4/495		
DIPE							
Dibutyl ether							
MTBE							
1,4-Dioxane				3.3	3+4/446		
THF							
Esters							
Me acetate	70	40	1198	6.6	5/349	0.15	P520
Et acetate	93	46	1220				
i-Propyl acetate	None		1251				
n-Butyl acetate							
Cellosolve acetate							
Miscellaneous							
DMF							
DMAc							
DMSO							
Sulfolane							
CS_2	–		–	–	–	–	–
Acetic acid	None		1180			127.2	P333
Aniline							
Nitrobenzene							
Morpholine							
Pyridine							
2-Nitropropane							
Acetonitrile	88			26.6	8/320		
Furfuraldehyde							
Phenol						0.43	P1663
Water	97	43	207				

Acetic Acid

Alternative names
Ethanoic acid, glacial acetic acid

Reference codes

CAS number	64 19 7	Hazchem code	
UN number	1842	EPA code	

Physical properties

Molecular weight	60	Cubic expansion coeff (per °C × 10^3)	1.14
Empirical formula	$C_2H_4O_2$	Surface tension (@20°C dyn/cm)	27.4
Boiling point (°C)	118	Absolute viscosity (@25°C cP)	1.13
Freezing point (°C)	+17	Refractive index (25°C)	1.370
Specific gravity (20/4)	1.051		

Fire hazards

Flash point (closed cup °C)	40	Lower explosive limit (ppm)	54000
Autoignition temperature (°C)	427	Upper explosive limit (ppm)	160000
Electrical conductivity	6E–9		

Health hazards

IDLH (ppm)	1000	Vapour concentration @21°C ppm	17400
OES-TWA	10	Vapour density (relative to air)	2.08
OES-STEL	15	Vapour pressure @21°C mmHg	13
Odour threshold (ppm)	2	POCP	

Aqueous effluent

Solubility in water (25°C %w/w)		Total
Solubility of water in (25°C %w/w)		Total
Log_{10} activated carbon partition		1.80
Log_{10} partition in octanol/water (w/w)		–0.24
Biological oxygen demand w/w (days)		
Theoretical oxygen demand w/w		1.07

Vapour pressure equation constants (Log_{10}, mmHg)

Antoine equation	A	7.5596
	B	1644.05
	C	233.5
Cox chart	A	7.4565
	B	1592.4

Solvent properties

Solubility parameter	10.1	Kauri butanol value	
Dipole (D)	1.7	Evaporation time (ether = 1)	
Dielectric constant (20°C)	6.2	Evaporation time (BuAc = 1)	
Polarity (water 100)	64.8		

Thermal information

Latent heat (cal/mol)	5800
Nett heat of combustion (kcal/gmol)	188
Specific heat (cal/mol/°C)	29.4
Critical pressure (MN/m^2)	5.8
Critical temperature (K)	595
Latent heat of fusion (cal/mol)	2800
Van der Waals' volume	2.20
Van der Waals' surface area	2.07
Molar volume	57.5

Solute	Azeotrope X% w/w	Azeotrope °C	Azeotrope Reference	Solute γ^{∞}	Reference	Partition coefficient	Reference
Hydrocarbons							
n-Pentane	None		3156				
n-Hexane	6	68	3184	9.0	5/152		
n-Heptane	25	93	3204	20	5/175		
n-Octane	53	105	3219	16	5/189		
n-Nonane	69	113	3230				
n-Decane	79	117	3237	31	5/191		
2,2,4-TMP							
Cyclohexane	10	79	3173	4.9	5/146		
Benzene	2	80	3163	3.3	5/127		
Toluene	34	105	3194	7.6	5/159		
Ethylbenzene	66	115	3206	7.9	5/178		
Xylenes	73	116	3208	5.6	5/181		
C_9 Aromatics							
Tetralin							
Alcohols							
Methanol	None		1933	0.9	2a/48		
Ethanol	None		3090	0.7	2c/293		
n-Propanol	None		3109	0.9	2a/525		
i-Propanol				0.8	2d/84		
n-Butanol	43	120	3135	1.0	2d/158		
i-Butanol				1.1	2f/302		
s-Butanol				1.2	2f/221		
n-Amyl alc.							
i-Amyl alc.	16	133	3156a				
Cyclohexanol							
1-Octanol							
Ethanediol							
DEG							
1,2-Propanediol							
Glycol ethers							
PGME							
EGME							
EEE							
EGBE							
Chlorinated							
MDC				1.9	5/64		
Chloroform	None		1437	2.6	5/62		
Carbon tet.	2	76	1099	5.4	5/59		
1,2-EDC	None		2961	2.6	5/74		
1,1,1-TCA							
TCE	4	118	2282	3.3	5/72		
Perk.	39	107	2158				
MCB	59	115	3160				

Miscellaneous solvents

Solute	Azeotrope X% w/w	Azeotrope °C	Azeotrope Reference	Solute γ^{∞}	Reference	Partition coefficient	Reference
Ketones							
Acetone	None		3101	1.0	3+4/148		
MEK	None		3117	1.1	3+4/269		
MIBK	None		3175	1.5	3+4/345		
Cyclohexanone							
NMP							
Acetophenone							
Ethers							
Diethyl ether	None		3136	1.9	3+4/502		
DIPE	None		3185	2.4	3+4/544		
Dibutyl ether	None		3220				
MTBE							
1,4-Dioxane	78	119	3119	0.9	3+4/448		
THF							
Esters							
Me acetate	None		3101a	1.1	5/82		
Et acetate	None		3120	1.2	5/104		
i-Propyl acetate	None		3147	1.6	5/123		
n-Butyl acetate	None		3177	1.8	5/147		
Cellosolve acetate							
Miscellaneous							
DMF							
DMAc	21	171	3133	0.1	5.115		
DMSO							
Sulfolane							
CS_2	None		1180				
Acetic acid	–		–	–	–	–	–
Aniline	None		3164				
Nitrobenzene	None		3162				
Morpholine							
Pyridine	51	138	3139	0.04	5/118		
2-Nitropropane							
Acetonitrile	None		2758a				
Furfuraldehyde	None		3138				
Phenol							
Water	None		231	1.4	1/102		

Aniline

Alternative names
Aminobenzene, benzeneamine, phenylamine

Reference codes			
CAS number	62 53 3	Hazchem code	
UN number	1547	EPA code	U012
Physical properties			
Molecular weight	93	Cubic expansion coeff (per °C × 10^3)	0.9
Empirical formula	$C_6H_7N_1$	Surface tension (@20°C dyn/cm)	45.5
Boiling point (°C)	184	Absolute viscosity (@25°C cP)	4.4
Freezing point (°C)	–6	Refractive index (25°C)	1.583
Specific gravity (20/4)	1.022		
Fire hazards			
Flash point (closed cup °C)	76	Lower explosive limit (ppm)	13000
Autoignition temperature (°C)	770	Upper explosive limit (ppm)	110000
Electrical conductivity	2.4E–8		
Health hazards			
IDLH (ppm)	100	Vapour concentration @21°C ppm	380
OES-TWA	0.5	Vapour density (relative to air)	3.23
OES-STEL		Vapour pressure @21°C mmHg	0.26
Odour threshold (ppm)	0.5	POCP	

Aqueous effluent	
Solubility in water (25°C %w/w)	3.5
Solubility of water in (25°C %w/w)	5.1
Log_{10} activated carbon partition	2.78
Log_{10} partition in octanol/water (w/w)	+0.94
Biological oxygen demand w/w (days)	1.50 (5)
Theoretical oxygen demand w/w	2.67

Vapour pressure equation constants (Log_{10}, mmHg)		
Antoine equation	A	7.46441
	B	1840.79
	C	216.92
Cox chart	A	7.55756
	B	1936.2

Solvent properties			
Solubility parameter	10.3	Kauri butanol value	
Dipole (D)	1.56	Evaporation time (ether = 1)	
Dielectric constant (30°C)	6.7	Evaporation time (BuAc = 1)	
Polarity (water 100)	42.0		

Thermal information	
Latent heat (cal/mol)	10602
Nett heat of combustion (kcal/gmol)	773
Specific heat (cal/mol/°C)	48
Critical pressure (MN/m^2)	5.30
Critical temperature (K)	699
Latent heat of fusion (cal/mol)	2519
Van der Waals' volume	3.72
Van der Waals' surface area	2.82
Molar volume	91.53

Solute	Azeotrope X% w/w	Azeotrope °C	Azeotrope Reference	Solute γ^{∞}	Reference	Partition coefficient	Reference
Hydrocarbons							
n-Pentane				17.4	1x/1/240		
n-Hexane	None		11151	6.8	6a/580		
n-Heptane	None		11179	11.0	6b/161		
n-Octane	None		11197	38	1x/3/1194		
n-Nonane	13	149	11210	26	1x/1/242		
n-Decane	36	167	11230				
2,2,4-TMP	None		11196	6.0	6b/318		
Cyclohexane	None		11148	4.1	6a/255		
Benzene	None		10850	1.4	7/263		
Toluene	None		11167	1.6	7/426		
Ethylbenzene	None		11183	2.3	7/474		
Xylenes	None		11185	3.1	1x/3/1194		
C_9 Aromatics							
Tetralin							
Alcohols							
Methanol				2.2	1x/3/1192		
Ethanol	None		4075	3.3	2a/427		
n-Propanol							
i-Propanol							
n-Butanol	None		8138	2.3	1x/3/1193		
i-Butanol							
s-Butanol				2.9	2b/265		
n-Amyl alc.							
i-Amyl alc.	None		9824				
Cyclohexanol	None		11149	1.6	2b/395		
1-Octanol	83	184	11200				
Ethanediol	76	181	4242	3.6	2b/16		
DEG							
1,2-Propanediol	57	186	6655				
Glycol ethers							
PGME	None		9963				
EGME							
EEE							
EGBE	None		11153				
Chlorinated							
MDC				1.4	1x/1/239		
Chloroform				1.5	1x/1/239		
Carbon tet.	None			3.8	8/174		
1,2-EDC							
1,1,1-TCA							
TCE							
Perk.							
MCB	None		10511	1.8	8/527		

Miscellaneous solvents

Solute	Azeotrope X% w/w	°C	Reference	Solute γ^{∞}	Reference	Partition coefficient	Reference
Ketones							
Acetone	None			1.3	3b/183		
MEK				0.6	1x/3/1192		
MIBK							
Cyclohexanone	None		11144				
NMP							
Acetophenone	None		11182				
Ethers							
Diethyl ether							
DIPE							
Dibutyl ether	None		11198				
MTBE							
1,4-Dioxane				0.4	1x/3/1192		
THF							
Esters							
Me acetate							
Et acetate				1.4	1x/1/239		
i-Propyl acetate							
n-Butyl acetate							
Cellosolve acetate							
Miscellaneous							
DMF	Azeo?			0.3	8/428		
DMAc							
DMSO							
Sulfolane							
CS_2				3.5	1x/1/239		
Acetic acid	None		3164				
Aniline	–		–	–	–	–	–
Nitrobenzene	3	180	10704	6.4	8/540		
Morpholine							
Pyridine	Azeo?			?	8/500	0.05	V3/233
2-Nitropropane							
Acetonitrile	None			0.9	8/385		
Furfuraldehyde							
Phenol						0.01	V3/290
Water	25	81	488	4.5	1/499		

Nitrobenzene

Alternative names
Oil of mirbane, nitrobenzol

Reference codes			
CAS number	98 95 3	Hazchem code	2Y
UN number	1662	EPA code	U169
Physical properties			
Molecular weight	123	Cubic expansion coeff (per °C × 10^3)	0.96
Empirical formula	$C_6H_6N_1O_2$	Surface tension (@20°C dyn/cm)	43.9
Boiling point (°C)	211	Absolute viscosity (@25°C cP)	1.80
Freezing point (°C)	+6	Refractive index (25°C)	1.550
Specific gravity (20/4)	1.204		
Fire hazards			
Flash point (closed cup °C)	88	Lower explosive limit (ppm)	18000
Autoignition temperature (°C)	496	Upper explosive limit (ppm)	
Electrical conductivity	2E–10		
Health hazards			
IDLH (ppm)	200	Vapour concentration @21°C ppm	272
OES-TWA	1	Vapour density (relative to air)	4.27
OES-STEL	2	Vapour pressure @21°C mmHg	0.21
Odour threshold (ppm)	6	POCP	
Aqueous effluent			
Solubility in water (25°C %w/w)		**0.19**	
Solubility of water in (25°C %w/w)			
Log_{10} activated carbon partition			
Log_{10} partition in octanol/water (w/w)		+1.86	
Biological oxygen demand w/w (days)			
Theoretical oxygen demand w/w		1.82	
Vapour pressure equation constants (Log_{10}, mmHg)			
Antoine equation	A	7.13043	
	B	1751.36	
	C	201.34	
Cox chart	A		
	B		
Solvent properties			
Solubility parameter	10.0	Kauri butanol value	
Dipole (D)	4.0	Evaporation time (ether = 1)	
Dielectric constant (20°C)	34.8	Evaporation time (BuAc = 1)	
Polarity (water 100)	32.4		
Thermal information			
Latent heat (cal/mol)	10455		
Nett heat of combustion (kcal/gmol)	706		
Specific heat (cal/mol/°C)	44		
Critical pressure (MN/m^2)	4.82		
Critical temperature (K)	720		
Latent heat of fusion (cal/mol)	2768		
Van der Waals' volume	4.08		
Van der Waals' surface area	3.10		
Molar volume	102.7		

Solute	Azeotrope X% w/w	Azeotrope °C	Azeotrope Reference	Solute γ∞	Reference	Partition coefficient	Reference
Hydrocarbons							
n-Pentane	None		9740	7.0	1x/1/222		
n-Hexane	None		10708	8.7	6a/532		
n-Heptane				6.7	1x/1/223		
n-Octane				3.9	6b/241		
n-Nonane				8.0	1x/1/223		
n-Decane							
2,2,4-TMP				11.8	1x/1/223		
Cyclohexane				9.6	6a/203		
Benzene	None		10703	1.1	7/253		
Toluene	None		10718	1.5	7/422		
Ethylbenzene				1.6	7/470		
Xylenes				1.8	1x/1/223		
C_9 Aromatics							
Tetralin							
Alcohols							
Methanol	None		2065	10.4	1x/1/220	5.9	P165
Ethanol	None		4072	10.7	1x/1/220	3.5	V2/349
n-Propanol							
i-Propanol							
n-Butanol	None		8135				
i-Butanol							
s-Butanol	None		8231	16.0	2f/226		
n-Amyl alc.						0.02	V3/257
i-Amyl alc.							
Cyclohexanol							
1-Octanol	None		10754				
Ethanediol	41	186	4238				
DEG	90	210	8518				
1,2-Propanediol							
Glycol ethers							
PGME							
EGME							
EEE							
EGBE	None		10710				
Chlorinated							
MDC				1.0	1x/1/220		
Chloroform	None		1485	1.0	1/1/220		
Carbon tet.	None		1153	1.8	8/168		
1,2-EDC				1.1	1x/1/220		
1,1,1-TCA							
TCE							
Perk.							
MCB	None		10508	1.1	1x/3/1180		

Miscellaneous solvents

Solute	Azeotrope X% w/w	Azeotrope °C	Azeotrope Reference	Solute γ^{∞}	Reference	Partition coefficient	Reference
Ketones							
Acetone				1.2	1x/1/221		
MEK				1.1	3b/316		
MIBK							
Cyclohexanone							
NMP							
Acetophenone	None		10733				
Ethers							
Diethyl ether	None		8297				
DIPE							
Dibutyl ether							
MTBE							
1,4-Dioxane				0.8	1x/3/1180		
THF							
Esters							
Me acetate							
Et acetate				1.4	1x/1/221		
i-Propyl acetate							
n-Butyl acetate							
Cellosolve acetate							
Miscellaneous							
DMF							
DMAc							
DMSO							
Sulfolane							
CS_2				2.6	1x/1/220		
Acetic acid	None		3162			3.9	P311
Aniline	97	180	10704	1.0	8/540	0.01	V3/260
Nitrobenzene	–		–	–	–	–	–
Morpholine							
Pyridine							
2-Nitropropane							
Acetonitrile				1.7	1x/1/220		
Furfuraldehyde							
Phenol						0.02	V3/259
Water	12	99	485				

Morpholine

Alternative names
Tetrahydro. p. oxazine, diethyeneimide oxide, tetrahydro-1,4-isoxazine

Reference codes			
CAS number	110 91 8	Hazchem code	2P
UN number	2054	EPA code	
Physical properties			
Molecular weight	87	Cubic expansion coeff (per °C × 10^3)	1.1
Empirical formula	$C_4H_9N_1O_1$	Surface tension (@20°C dyn/cm)	37.5
Boiling point (°C)	129	Absolute viscosity (@25°C cP)	2.2
Freezing point (°C)	–5	Refractive index (25°C)	1.455
Specific gravity (20/4)	1.00		
Fire hazards			
Flash point (closed cup °C)	38	Lower explosive limit (ppm)	18000
Autoignition temperature (°C)	310	Upper explosive limit (ppm)	108000
Electrical conductivity	6E–10		
Health hazards			
IDLH (ppm)		Vapour concentration @21°C ppm	10500
OES-TWA	20	Vapour density (relative to air)	3.0
OES-STEL	30	Vapour pressure @21°C mmHg	7.9
Odour threshold (ppm)	1	POCP	
Aqueous effluent			
Solubility in water (25°C %w/w)		Total	
Solubility of water in (25°C %w/w)		Total	
Log_{10} activated carbon partition			
Log_{10} partition in octanol/water (w/w)		–1.08	
Biological oxygen demand w/w (days)			
Theoretical oxygen demand w/w		2.11	
Vapour pressure equation constants (Log_{10}, mmHg)			
Antoine equation	A	7.1603	
	B	1447.7	
	C	210.0	
Cox chart	A		
	B		
Solvent properties			
Solubility parameter		Kauri butanol value	
Dipole (D)	1.56	Evaporation time (ether = 1)	
Dielectric constant (20°C)	7.4	Evaporation time (BuAc = 1)	
Polarity (water 100)	31.8		
Thermal information			
Latent heat (cal/mol)	9510		
Nett heat of combustion (kcal/gmol)			
Specific heat (cal/mol/°C)	42		
Critical pressure (MN/m^2)	5.5		
Critical temperature (K)	618		
Latent heat of fusion (cal/mol)			
Van der Waals' volume	3.47		
Van der Waals' surface area	2.80		
Molar volume	87.5		

Solute	Azeotrope X% w/w	Azeotrope °C	Azeotrope Reference	Solute γ^{∞}	Reference	Partition coefficient	Reference
Hydrocarbons							
n-Pentane							
n-Hexane				27.0	1x/1/123		
n-Heptane							
n-Octane							
n-Nonane							
n-Decane							
2,2,4-TMP							
Cyclohexane							
Benzene				3.3	1x/1/123		
Toluene							
Ethylbenzene				1.9	3+4/482		
Xylenes	None		8057				
C_9 Aromatics							
Tetralin							
Alcohols							
Methanol							
Ethanol				0.9	2c/345		
n-Propanol							
i-Propanol							
n-Butanol							
i-Butanol							
s-Butanol							
n-Amyl alc.							
i-Amyl alc.							
Cyclohexanol							
1-Octanol							
Ethanediol							
DEG							
1,2-Propanediol							
Glycol ethers							
PGME							
EGME							
EEE							
EGBE							
Chlorinated							
MDC							
Chloroform							
Carbon tet.							
1,2-EDC							
1,1,1-TCA							
TCE							
Perk.							
MCB							

Miscellaneous solvents

Solute	Azeotrope X% w/w	Azeotrope °C	Azeotrope Reference	Solute γ^{∞}	Reference	Partition coefficient	Reference
Ketones							
Acetone							
MEK							
MIBK							
Cyclohexanone							
NMP							
Acetophenone							
Ethers							
Diethyl ether							
DIPE							
Dibutyl ether	73	127	8058				
MTBE							
1,4-Dioxane							
THF							
Esters							
Me acetate							
Et acetate							
i-Propyl acetate							
n-Butyl acetate							
Cellosolve acetate							
Miscellaneous							
DMF							
DMAc							
DMSO							
Sulfolane							
CS_2							
Acetic acid							
Aniline							
Nitrobenzene							
Morpholine	–		–	–	–	–	–
Pyridine							
2-Nitropropane							
Acetonitrile							
Furfuraldehyde							
Phenol							
Water	None		367	2.0	1a/327		

Pyridine

Alternative names

Reference codes

CAS number	110 86 1	Hazchem code	2WE
UN number	1252	EPA code	U196

Physical properties

Molecular weight	79	Cubic expansion coeff (per °C × 10^3)	1.0
Empirical formula	$C_5H_6N_1$	Surface tension (@20°C dyn/cm)	36.6
Boiling point (°C)	115	Absolute viscosity (@25°C cP)	0.88
Freezing point (°C)	–42	Refractive index (25°C)	1.507
Specific gravity (20/4)	0.983		

Fire hazards

Flash point (closed cup °C)	20	Lower explosive limit (ppm)	18000
Autoignition temperature (°C)	522	Upper explosive limit (ppm)	124000
Electrical conductivity	4E–8		

Health hazards

IDLH (ppm)	3600	Vapour concentration @21°C ppm	22000
OES-TWA	5	Vapour density (relative to air)	2.74
OES-STEL	10	Vapour pressure @21°C mmHg	16.6
Odour threshold (ppm)	0.03	POCP	

Aqueous effluent

Solubility in water (25°C %w/w)		Total
Solubility of water in (25°C %w/w)		Total
Log_{10} activated carbon partition		2.26
Log_{10} partition in octanol/water (w/w)		+0.64
Biological oxygen demand w/w (days)		1.47 (5)
Theoretical oxygen demand w/w		3.03

Vapour pressure equation constants (Log_{10}, mmHg)

Antoine equation	A	7.01328
	B	1356.93
	C	212.655
Cox chart	A	
	B	

Solvent properties

Solubility parameter	10.7	Kauri butanol value	
Dipole (D)	2.3	Evaporation time (ether = 1)	12.7
Dielectric constant (20°C)	12.9	Evaporation time (BuAc = 1)	
Polarity (water 100)	30.2		

Thermal information

Latent heat (cal/mol)	8374
Nett heat of combustion (kcal/gmol)	617
Specific heat (cal/mol/°C)	34
Critical pressure (MN/m^2)	5.64
Critical temperature (K)	620
Latent heat of fusion (cal/mol)	
Van der Waals' volume	3.00
Van der Waals' surface area	2.11
Molar volume	80.86

Solute	Azeotrope X% w/w	Azeotrope °C	Azeotrope Reference	Solute γ^{∞}	Reference	Partition coefficient	Reference
Hydrocarbons							
n-Pentane				7.2	1x/3/1092		
n-Hexane	None			4.8	1x/3/1092		
n-Heptane	25	96	8860	4.6	6b/116		
n-Octane	56	110	8867	3.9	6b/239		
n-Nonane	90	115	8870	4.2	6b/354		
n-Decane	None		8872	3.8	6b/386		
2,2,4-TMP	23	96	8868	10.3	6b/297		
Cyclohexane	None		8846	2.5	6a/177		
Benzene	None		8841	1.3	7/220		
Toluene	21	110	8858	1.5	7/406		
Ethylbenzene	None		8861				
Xylenes	None		8863	1.3	7/482		
C_9 Aromatics							
Tetralin							
Alcohols							
Methanol	None		2024	1.1	2a/183		
Ethanol	44	73	2760	1.1	2c/355		
n-Propanol	None		6469	0.9	2c/512		
i-Propanol				1.1	2d/57		
n-Butanol	30	119	8109	1.0	2b/166		
i-Butanol				0.4	2f/307		
s-Butanol	None		8217	0.9	2b/255		
n-Amyl alc.	None		8836				
i-Amyl alc.	None		8838				
Cyclohexanol							
1-Octanol							
Ethanediol	None		4215				
DEG							
1,2-Propanediol							
Glycol ethers							
PGME							
EGME	None		6550				
EEE	None		8407				
EGBE							
Chlorinated							
MDC	None			0.6	8/267		
Chloroform	None		1480a	0.44	8/240		
Carbon tet.	None			1.5	8/140		
1,2-EDC							
1,1,1-TCA							
TCE							
Perk.	48	113	2192	1.9	8/346		
MCB							

Miscellaneous solvents

Solute	Azeotrope X% w/w	°C	Reference	Solute γ^{∞}	Reference	Partition coefficient	Reference
Ketones							
Acetone	None		5353	1.2	3+4/181		
MEK				1.0	1x/3/1092		
MIBK	60	115	8849	1.0	3b/531		
Cyclohexanone							
NMP							
Acetophenone							
Ethers							
Diethyl ether							
DIPE							
Dibutyl ether							
MTBE							
1,4-Dioxane	None		2769a	1.0	1x/3/1092		
THF							
Esters							
Me acetate							
Et acetate							
i-Propyl acetate							
n-Butyl acetate	None		8850				
Cellosolve acetate							
Miscellaneous							
DMF							
DMAc							
DMSO							
Sulfolane							
CS_2							
Acetic acid	49	138	3139	0.09	5/118		
Aniline	None			0.4	8/500		
Nitrobenzene							
Morpholine							
Pyridine	–		–	–	–	–	–
2-Nitropropane							
Acetonitrile	None		2779b				
Furfuraldehyde							
Phenol	13	183	8842				
Water	57	94	395	2.8	1/469		

2-Nitropropane

Alternative names
2NP, sec nitropropane

Reference codes			
CAS number	79 46 9	Hazchem code	2Y
UN number	2608	EPA code	U171
Physical properties			
Molecular weight	89	Cubic expansion coeff (per °C × 10^3)	1.1
Empirical formula	$C_3H_7N_1O_2$	Surface tension (@20°C dyn/cm)	30
Boiling point (°C)	120	Absolute viscosity (@25°C cP)	0.74
Freezing point (°C)	–93	Refractive index (25°C)	1.392
Specific gravity (20/4)	0.992		
Fire hazards			
Flash point (closed cup °C)	28	Lower explosive limit (ppm)	26000
Autoignition temperature (°C)	428	Upper explosive limit (ppm)	110000
Electrical conductivity	5E–7		
Health hazards			
IDLH (ppm)	2300	Vapour concentration @21°C ppm	22000
OES-TWA	5	Vapour density (relative to air)	3.18
OES-STEL		Vapour pressure @21°C mmHg	16
Odour threshold (ppm)	300	POCP	
Aqueous effluent			
Solubility in water (25°C %w/w)		1.76	
Solubility of water in (25°C %w/w)		0.5	
Log_{10} activated carbon partition			
Log_{10} partition in octanol/water (w/w)			
Biological oxygen demand w/w (days)			
Theoretical oxygen demand w/w		1.35	
Vapour pressure equation constants (Log_{10}, mmHg)			
Antoine equation	A	7.4211	
	B	1625.43	
	C	237.6	
Cox chart	A		
	B		
Solvent properties			
Solubility parameter	10.4	Kauri butanol value	
Dipole (D)	1.9	Evaporation time (ether = 1)	10
Dielectric constant (20°C)	25.5	Evaporation time (BuAc = 1)	1.5
Polarity (water 100)	37.3		
Thermal information			
Latent heat (cal/mol)	8811		
Nett heat of combustion (kcal/gmol)	441		
Specific heat (cal/mol/°C)	42		
Critical pressure (MN/m^2)			
Critical temperature (K)	618		
Latent heat of fusion (cal/mol)			
Van der Waals' volume	3.36		
Van der Waals' surface area	2.94		
Molar volume	90.1		

Solute	Azeotrope X% w/w	Azeotrope °C	Azeotrope Reference	Solute γ^{∞}	Reference	Partition coefficient	Reference
Hydrocarbons							
n-Pentane				6.5	1x/1/63		
n-Hexane	3	68	6284	6.6	6a/510		
n-Heptane	21	95	6289	4.0	6b/100		
n-Octane	47	111	6291				
n-Nonane	75	118	6293				
n-Decane							
2,2,4-TMP	21	95	6292				
Cyclohexane	10	81	6283	5.7	1x/1/63		
Benzene	None		6281	1.3	7/186		
Toluene	18	110	6285				
Ethylbenzene	92	120	6290				
Xylenes							
C_9 Aromatics							
Tetralin							
Alcohols							
Methanol	None		1977	8.4	1x/1/63	1.10	V2/86
Ethanol	6	78	3978	8.4	1x/1/63		
n-Propanol	25	96	6271				
i-Propanol	4	82	6270				
n-Butanol	52	112	6275				
i-Butanol	33	105	6278				
s-Butanol	18	99	6276				
n-Amyl alc.	85	120	6280				
i-Amyl alc.							
Cyclohexanol							
1-Octanol							
Ethanediol							
DEG							
1,2-Propanediol							
Glycol ethers							
PGME							
EGME							
EEE	85	119	6279				
EGBE							
Chlorinated							
MDC				0.9	1x/1/63		
Chloroform				0.9	1x/1/63		
Carbon tet.	None		1114	2.3	1x/1/63		
1,2-EDC							
1,1,1-TCA							
TCE							
Perk.							
MCB							

Miscellaneous solvents

Solute	Azeotrope X% w/w	°C	Reference	Solute γ^{∞}	Reference	Partition coefficient	Reference
Ketones							
Acetone							
MEK	None		6272				
MIBK							
Cyclohexanone	None		6282				
NMP							
Acetophenone							
Ethers							
Diethyl ether							
DIPE							
Dibutyl ether							
MTBE							
1,4-Dioxane							
THF	None		6273				
Esters							
Me acetate							
Et acetate	None		6274				
i-Propyl acetate							
n-Butyl acetate							
Cellosolve acetate							
Miscellaneous							
DMF							
DMAc							
DMSO							
Sulfolane							
CS_2				4.0	1x/1/63		
Acetic acid							
Aniline							
Nitrobenzene							
Morpholine							
Pyridine							
2-Nitropropane	–		–	–	–	–	–
Acetonitrile							
Furfuraldehyde							
Phenol							
Water	71	89	290				

Acetonitrile

Alternative names
Methyl cyanide, ACN, ethane nitrile, cyanomethane

Reference codes			
CAS number	75 05 8	Hazchem code	2WE
UN number	1648	EPA code	U003
Physical properties			
Molecular weight	41	Cubic expansion coeff (per °C × 10^3)	1.4
Empirical formula	$C_2H_3N_1$	Surface tension (@20°C dyn/cm)	29.1
Boiling point (°C)	81.6	Absolute viscosity (@25°C cP)	0.38
Freezing point (°C)	–44	Refractive index (25°C)	1.342
Specific gravity (20/4)	0.782		
Fire hazards			
Flash point (closed cup °C)	6	Lower explosive limit (ppm)	44000
Autoignition temperature (°C)	524	Upper explosive limit (ppm)	160000
Electrical conductivity	6E–10		
Health hazards			
IDLH (ppm)	4000	Vapour concentration @21°C ppm	96000
OES-TWA	40	Vapour density (relative to air)	1.42
OES-STEL	60	Vapour pressure @21°C mmHg	71
Odour threshold (ppm)	40	POCP	
Aqueous effluent			
Solubility in water (25°C %w/w)		Total	
Solubility of water in (25°C %w/w)		Total	
Log_{10} activated carbon partition			
Log_{10} partition in octanol/water (w/w)		–0.34	
Biological oxygen demand w/w (days)		1.22	
Theoretical oxygen demand w/w		2.15	
Vapour pressure equation constants (Log_{10}, mmHg)			
Antoine equation	A	7.33986	
	B	1482.29	
	C	250.523	
Cox Chart	A	7.12578	
	B	1322.7	
Solvent properties			
Solubility parameter	11.9	Kauri butanol value	
Dipole (D)	3.2	Evaporation time (ether = 1)	2.04
Dielectric constant (20°C)	37.5	Evaporation time (BuAc = 1)	
Polarity (water 100)	46		
Thermal information			
Latent heat (cal/mol)	7134		
Nett heat of combustion (kcal/gmol)	289		
Specific heat (cal/mol/°C)	22		
Critical pressure (MN/m^2)	4.83		
Critical temperature (K)	548		
Latent heat of fusion (cal/mol)			
Van der Waals' volume	1.87		
Van der Waals' surface area	1.72		
Molar volume	52.86		

Solute	Azeotrope X% w/w	Azeotrope °C	Azeotrope Reference	Solute γ^{∞}	Reference	Partition coefficient	Reference
Hydrocarbons							
n-Pentane	11	35	2792	21.3	1x/3/953		
n-Hexane	28	57	2800	27	1x/1/15		
n-Heptane	46	69	2803	32.8	6b/79		
n-Octane	66	77	2810	57	1x/1/16		
n-Nonane		80	2812	86	1x/1/16		
n-Decane		82	2815				
2,2,4-TMP	41	69	2811	44	1x/1/16		
Cyclohexane	33	62	2797	22.0	1x/1/14		
Benzene	34	73	2795	2.5	7/124		
Toluene	76	81	2801	4.5	7/373		
Ethylbenzene	None		2804	5.0	7/465		
Xylenes	None		2805	5.5	7/499		
C_9 Aromatics				7.3	1x/3/955		
Tetralin							
Alcohols							
Methanol	81	64	1925	3.0	2a/43		
Ethanol	44	73	2760	3.7	2a/298		
n-Propanol	72	81	2768	6.5	1x/3/951		
i-Propanol	52	75	2767	2.4	2f/40		
n-Butanol	None			4.8	2d/156		
i-Butanol	None		2779	3.3	2f/300		
s-Butanol				2.7	2d/241		
n-Amyl alc.							
i-Amyl alc.							
Cyclohexanol							
1-Octanol							
Ethanediol				9.2	2f/1		
DEG							
1,2-Propanediol							
Glycol ethers							
PGME							
EGME				1.7	2d/109		
EEE							
EGBE							
Chlorinated							
MDC	None		1546	1.2	8/258		
Chloroform	None		1433	1.4	8/217		
Carbon tet.	17	65	1095	4.4	8/86		
1,2-EDC	49	79	2757	1.4	8/364		
1,1,1-TCA							
TCE	29	75	2280	3.4	8/349		
Perk.							
MCB	None		2794a	2.8	8/381		

Miscellaneous solvents

Solute	Azeotrope X% w/w	Azeotrope °C	Azeotrope Reference	Solute γ^{∞}	Reference	Partition coefficient	Reference
Ketones							
Acetone	None		2762	1.0	3+4/143		
MEK	27			1.2	3b/268		
MIBK							
Cyclohexanone							
NMP							
Acetophenone							
Ethers							
Diethyl ether	None		2778	3.2	3+4/499		
DIPE							
Dibutyl ether							
MTBE							
1,4-Dioxane	None		2769a	1.4	1x/3/951		
THF							
Esters							
Me acetate	None		2763	1.1	5/354		
Et acetate	23	75	2770	1.6	5/455		
i-Propyl acetate	60	80	2788				
n-Butyl acetate				1.8	5/577		
Cellosolve acetate							
Miscellaneous							
DMF	None		2765				
DMAc							
DMSO							
Sulfolane							
CS_2				17.9	8/320		
Acetic acid	None		2758a				
Aniline				1.0	8/385		
Nitrobenzene							
Morpholine							
Pyridine	None		2779b	1.8	1x/1/14		
2-Nitropropane							
Acetonitrile	–		–	–	–	–	–
Furfuraldehyde							
Phenol							
Water	84	76	226	6.1	1/81		

Furfuraldehyde

Alternative names
Furfural, furfurol, 2-furaldehyde, fural

Reference codes			
CAS number	98 01 1	Hazchem code	
UN number	1199	EPA code	U125
Physical properties			
Molecular weight	96	Cubic expansion coeff (per °C × 10^3)	1.06
Empirical formula	$C_5H_4O_2$	Surface tension (@20°C dyn/cm)	45
Boiling point (°C)	162	Absolute viscosity (@25°C cP)	1.4
Freezing point (°C)	–37	Refractive index (25°C)	1.524
Specific gravity (20/4)	1.160		
Fire hazards			
Flash point (closed cup °C)	62	Lower explosive limit (ppm)	21000
Autoignition temperature (°C)	315	Upper explosive limit (ppm)	193000
Electrical conductivity			
Health hazards			
IDLH (ppm)	250	Vapour concentration @21°C ppm	2400
OES-TWA	2	Vapour density (relative to air)	3.33
OES-STEL	10	Vapour pressure @21°C mmHg	1.81
Odour threshold (ppm)	0.2	POCP	
Aqueous effluent			
Solubility in water (25°C %w/w)		8.4	
Solubility of water in (25°C %w/w)		5.0	
Log_{10} activated carbon partition			
Log_{10} partition in octanol/water (w/w)		+0.23	
Biological oxygen demand w/w (days)		0.77 (5)	
Theoretical oxygen demand w/w		1.67	
Vapour pressure equation constants (Log_{10}, mmHg)			
Antoine equation	A	8.40200	
	B	2338.49	
	C	261.638	
Cox chart	A		
	B		
Solvent properties			
Solubility parameter	11.2	Kauri butanol value	
Dipole (D)	3.6	Evaporation time (ether = 1)	75
Dielectric constant (20°C)	41.9	Evaporation time (BuAc = 1)	
Polarity (water 100)			
Thermal information			
Latent heat (cal/mol)	9216		
Nett heat of combustion (kcal/gmol)	539		
Specific heat (cal/mol/°C)	36		
Critical pressure (MN/m^2)	5.03		
Critical temperature (K)	660		
Latent heat of fusion (cal/mol)			
Van der Waals' volume	3.17		
Van der Waals' surface area	2.48		
Molar volume	83.23		

Solute	Azeotrope X% w/w	Azeotrope °C	Azeotrope Reference	Solute γ^{∞}	Reference	Partition coefficient	Reference
Hydrocarbons							
n-Pentane							
n-Hexane							
n-Heptane	5	98	8781	7.1	3+4/50		
n-Octane	None		8797	6.0	3a/137		
n-Nonane							
n-Decane				11.7	3+4/59		
2,2,4-TMP				8.9	3+4/55		
Cyclohexane	None		8763	8.0	3+4/45		
Benzene	None		8760	1.6	3+4/44		
Toluene	None		8776	1.7	3a/135		
Ethylbenzene	None		8783	2.5	3+4/51		
Xylenes	10	139	8785	2.8	3+4/52		
C_9 Aromatics	60	155	8805				
Tetralin							
Alcohols							
Methanol	None			1.0	2c/140		
Ethanol	None			3.8	2a/383		
n-Propanol						0.21	V2/558
i-Propanol						0.78	V2/591
n-Butanol				2.4	2f/155	0.12	V3/115
i-Butanol						0.06	V3/137
s-Butanol							
n-Amyl alc.							
i-Amyl alc.							
Cyclohexanol	5	156	8764				
1-Octanol	None		8789				
Ethanediol	None		4214			0.82	V2/421
DEG							
1,2-Propanediol							
Glycol ethers							
PGME	14	151	8753				
EGME	None		6549				
EEE	None		8406				
EGBE	88	161	8769				
Chlorinated							
MDC				0.9	3a/115		
Chloroform	None		1480	0.9	3+4/36		
Carbon tet.	None		1140	3.6	3+4/35		
1,2-EDC				1.1	3a/119		
1,1,1-TCA							
TCE				2.1	3+4/37		
Perk.	None		2191	2.4	3a/117		
MCB	None		8758				

Miscellaneous solvents

Solute	Azeotrope X% w/w	°C	Reference	Solute γ^{∞}	Reference	Partition coefficient	Reference
Ketones							
Acetone				2.8	3a/121	0.25	V2/471
MEK						0.11	V3/21
MIBK				1.6	3a/126		
Cyclohexanone	None		8762				
NMP							
Acetophenone							
Ethers							
Diethyl ether							
DIPE							
Dibutyl ether	20	138	8788	6.1	3a/139		
MTBE							
1,4-Dioxane							
THF							
Esters							
Me acetate							
Et acetate	None		7574	1.6	3a/123		
i-Propyl acetate							
n-Butyl acetate				1.6	3+4/46		
Cellosolve acetate	None		8766				
Miscellaneous							
DMF						1.13	V2/539
DMAc							
DMSO							
Sulfolane							
CS_2							
Acetic acid	None		3138			0.34	V2/230
Aniline							
Nitrobenzene							
Morpholine							
Pyridine						0.08	V3/182
2-Nitropropane							
Acetonitrile							
Furfuraldehyde	–		–	–	–	–	–
Phenol	None		8761				
Water	35	98	394	0.8	1/455		

Phenol

Alternative names
Hydroxy benzene, carbolic acid

Reference codes

CAS number	108 95 2	Hazchem code	
UN number	1671	EPA code	

Physical properties

Molecular weight	94	Cubic expansion coeff (per °C × 10^3)	0.9
Empirical formula	$C_6H_6O_1$	Surface tension (@55°C dyn/cm)	36.5
Boiling point (°C)	182	Absolute viscosity (@43°C cP)	4.3
Freezing point (°C)	+41	Refractive index (41°C)	1.542
Specific gravity (41/4)	1.058		

Fire hazards

Flash point (closed cup °C)	79	Lower explosive limit (ppm)	17000
Autoignition temperature (°C)	715	Upper explosive limit (ppm)	86000
Electrical conductivity	2.7E–8		

Health hazards

IDLH (ppm)	100	Vapour concentration @21°C ppm	815
OES-TWA	5	Vapour density (relative to air)	3.26
OES-STEL	10	Vapour pressure @21°C mmHg	0.62
Odour threshold (ppm)	20	POCP	

Aqueous effluent

Solubility in water (25°C %w/w)	8.4
Solubility of water in (25°C %w/w)	28.7
Log_{10} activated carbon partition	4.0
Log_{10} partition in octanol/water (w/w)	+1.47
Biological oxygen demand w/w (days)	
Theoretical oxygen demand w/w	2.38

Vapour pressure equation constants (Log_{10}, mmHg)

Antoine equation	A	6.9305
	B	1382.65
	C	159.5
Cox chart	A	7.84460
	B	2045.1

Solvent properties

Solubility parameter	11.3	Kauri butanol value	
Dipole (D) @40°C	2.2	Evaporation time (ether = 1)	
Dielectric constant (60°C)	10.0	Evaporation time (BuAc = 1)	
Polarity (water 100)	94.8		

Thermal information

Latent heat (cal/mol)	6768
Nett heat of combustion (kcal/gmol)	700
Specific heat (cal/mol/°C)	52
Critical pressure (MN/m^2)	6.13
Critical temperature (K)	694
Latent heat of fusion (cal/mol)	2750
Van der Waals' volume	3.55
Van der Waals' surface area	2.68
Molar volume	83.14

Solute	Azeotrope X% w/w	Azeotrope °C	Azeotrope Reference	Solute γ^{∞}	Reference	Partition coefficient	Reference
Hydrocarbons							
n-Pentane				10.9	1x/1/231		
n-Hexane				13.6	1x/1/233		
n-Heptane	None		10936	12.8	1x/1/234		
n-Octane	4	125	10959	19.8	2x/382		
n-Nonane				26.8	1x/1/235		
n-Decane	35	168	11016				
2,2,4-TMP				3.0	2b/383		
Cyclohexane				7.1	1x/1/232		
Benzene				2.6	1x/1/231		
Toluene	None		10920	2.8	1x/1/233		
Ethylbenzene	None		10943				
Xylenes	None		10944	3.2	1x/1/234		
C_9 Aromatics				2.0	2b/385		
Tetralin							
Alcohols							
Methanol						0.37	V2/125
Ethanol							
n-Propanol							
i-Propanol						0.13	V2/606
n-Butanol							
i-Butanol							
s-Butanol							
n-Amyl alc.	None		9749				
i-Amyl alc.	None		9822				
Cyclohexanol	87	183	10895	0.3	2b/370		
1-Octanol	13	195	10962				
Ethanediol	22	199	4240	2.6	2d/11		
DEG				0.8	2f/339		
1,2-Propanediol							
Glycol ethers							
PGME	86	183	9962				
EGME	None		6568				
EEE	None		8426				
EGBE	63	186	10904				
Chlorinated							
MDC				1.7	1x/1/230		
Chloroform				1.8	1x/1/230		
Carbon tet.	None		1155	4.2	1x/1/230		
1,2-EDC				2.1	1x/1/230		
1,1,1-TCA							
TCE							
Perk.							
MCB	None		10510				

Miscellaneous solvents

Solute	Azeotrope X% w/w	Azeotrope °C	Azeotrope Reference	Solute γ^{∞}	Reference	Partition coefficient	Reference
Ketones							
Acetone	None		5375				
MEK	None		7370	0.33	2b/358		
MIBK							
Cyclohexanone	72	185	10889	0.11	2b/368		
NMP							
Acetophenone	8	202	10939	0.3	2b/381		
Ethers							
Diethyl ether							
DIPE							
Dibutyl ether	None		10960				
MTBE							
1,4-Dioxane							
THF							
Esters							
Me acetate							
Et acetate							
i-Propyl acetate							
n-Butyl acetate	None		10896	0.46	2b/373		
Cellosolve acetate	72	185	10898				
Miscellaneous							
DMF							
DMAc							
DMSO							
Sulfolane							
CS_2				3.2	1x/1/230		
Acetic acid							
Aniline	42	185	10883				
Nitrobenzene							
Morpholine							
Pyridine	87	183	8842				
2-Nitropropane							
Acetonitrile							
Furfuraldehyde	None		8761				
Phenol	–		–	–	–	–	–
Water	9	99	487	12.5	1/496		

Water

Alternative names

Reference codes

CAS number		Hazchem code	
UN number		EPA code	

Physical properties

Molecular weight	18	Cubic expansion coeff (per °C × 10^3)	0.21
Empirical formula	H_2O_1	Surface tension (@20°C dyn/cm)	72.75
Boiling point (°C)	100	Absolute viscosity (@25°C cP)	0.89
Freezing point (°C)	0	Refractive index (25°C)	1.332
Specific gravity (20/4)	0.998		

Fire hazards

Flash point (closed cup °C)		Lower explosive limit (ppm)	
Autoignition temperature (°C)		Upper explosive limit (ppm)	

Electrical conductivity ($\times 10^{-1}$ siemen/cm) 5.0 (see *Key to tables*)

Health hazards

IDLH (ppm)		Vapour concentration @21°C ppm	25000
OES-TWA		Vapour density (relative to air)	0.625
OES-STEL		Vapour pressure @21°C mmHg	19
Odour threshold (ppm)		POCP	

Aqueous effluent

Solubility in water (25°C %w/w)
Solubility of water in (25°C %w/w)
Log_{10} activated carbon partition
Log_{10} partition in octanol/water (w/w)
Biological oxygen demand w/w (days)
Theoretical oxygen demand w/w

Vapour pressure equation constants (Log_{10}, mmHg)

Antoine equation	A	8.07131
	B	1730.63
	C	233.426
Cox chart	A	
	B	

Solvent properties

Solubility parameter ($cal^{1/2}$ $cm^{3/2}$)	23.4	Kauri butanol value	
Dipole (D)	1.87	Evaporation time (ether = 1)	
Dielectric constant (20°C)	79.7	Evaporation time (BuAc = 1)	
Polarity (water 100)	100		

Thermal information

Latent heat (cal/mol)	9703
Nett heat of combustion (kcal/gmol)	11.5
Specific heat (cal/mol/°C)	18
Critical pressure (MN/m^2)	22.1
Critical temperature (K)	647
Latent heat of fusion (cal/mol)	1432
Van der Waals' volume	0.92
Van der Waals' surface area	1.40
Molar volume	18.02

Solute	Azeotrope X% w/w	Azeotrope °C	Solubility of solute in X (ppm) @25°C	Solute γ^{∞}	Reference	H atm/mole fraction	Upper CST, °C
Hydrocarbons							
n-Pentane	1.4	35	38	870	1x/4/1656	70250	
n-Hexane	5.6	62	9.5	4500	1x/4/1658	71730	
n-Heptane	13	79	3	11000	1x/4/1659	150000	
n-Octane	25	90	0.6	96100	1x/4/1659	274000	
n-Nonane	40	95	0.2			330000	
n-Decane	51	97	0.02			262000	
2,2,4-TMP	11	79	2.2			186000	
Cyclohexane	8.4	69	55			10700	
Benzene	8.8	69	1800	2150	1x/4/1657	309	306
Toluene	19	85	520	9700	1x/4/1658	353	
Ethylbenzene	33	92	165	24000	1x/4/1659	447	
Xylenes	40	95	200	3630	1x/4/1659	313	
C_9 Aromatics	c.50	96					
Tetralin	80	99					
Alcohols							
Methanol	None		Total	2.18	1/40	0.39	
Ethanol	4.0	78	Total	5.80	1/153	0.45	
n-Propanol	28	88	Total	15.0	1/286	0.51	<–23
i-Propanol	12.6	80	Total	13.7	1/329	0.62	<–23
n-Butanol	42	93	73000	114.1	1/407	0.44	127
i-Butanol	33	90	87000	42.3	1/440	0.35	129
s-Butanol	27	87	198000	24.9	1/420	0.60	110
n-Amyl alc.	54	96	17000	22.7	1x/4/1656	0.68	182
i-Amyl alc.	50	95		60.6	1a/382		
Cyclohexanol	70	98	43000	115.4	1/514		184.7
1-Octanol	90	99	6000			0.88	
Ethanediol	None		Total	0.23	1a/173		<20
DEG	None		Total	2.23	1a/353		<20
1,2-Propanediol	None		Total	0.61	1a/337		<20
Glycol ethers							
PGME	35	97	Total				
EGME	78	100	Total				<20
EEE	87	98	Total	6.9	1a/450		<20
EGBE	79	99	Total*	14.8	1/526		128
Chlorinated							
MDC	1.5	38	13000	336	1/1	138	
Chloroform	2.8	56	8200	665	1x/4/1644	225	
Carbon tet.	4	66	770	6400	1x/4/1644	1634	
1,2-EDC	8.7	72	8100	626	1x/4/1648	65	
1,1,1-TCA	4	65	1300	5500	1x/4/1647	1666	
TCE	6.2	73	1100	5100	1x/4/1646	648	
Perk.	16.5	88	150			1492	
MCB	28	90	490	3000	1x/4/1657	25.2	>220

Miscellaneous solvents

Solute	Azeotrope X% w/w	Azeotrope °C	Solubility of solute in X (ppm) @25°C	Solute γ^{∞}	Reference	H Atm/Mole fraction	Upper CST, °C
Ketones							
Acetone	None		Total	10.2	1/237	2.38	<–11
MEK	11	73	260000†	27.2	1/363	2.42	139
MIBK	24	88	17000	15.1	1b/337	3.0	
Cyclohexanone	55	96	23000	38.3	1/511	0.82	
NMP	None		Total	1.6	1a/379		
Acetophenone	82	98	5500	1277	1/46		220
Ethers							
Diethyl ether	1.3	34	69000	98.2	1a/257	48.3	202
DIPE	4.5	62	12000	4.3	1/525	96.3	
Dibutyl ether	33	93	300				
MTBE	3	52	43000				
1,4-Dioxane	18	88	Total	8.2	1/382	0.38	<–15
THF	5.3	64	Total‡	24.3	1x/4/1653	6.0	138
Esters							
Me acetate	5	56	245000	23.6	1/264		108
Et acetate	8.5	70	77000	108	1x/4/1653	5.15	
i-Propyl acetate	10	77	29000	242	1x/4/1656		
n-Butyl acetate	29	90	7000	995	1/516		
Cellosolve acetate	50	97	229000				
Miscellaneous							
DMF	None		Total	2.2	1/276		
DMAc	None		Total	1.6	1a/402		<25
DMSO	None		Total	0.43	1/199		
Sulfolane	None		Total	14.8	1a/316		
CS_2	2.8	43		2100	3300	1X/4/1646	1067
Acetic acid	None		Total	3.6	1/102	0.07	<–27
Aniline	41	87	35000	22.6	1/499	0.16	167
Nitrobenzene	86	99	1900			1.03	
Morpholine	None		Total	1.05	1a/327		
Pyridine	43	94	Total	42.8	1/469	0.61	
2-Nitropropane	29	89	17600			6720	
Acetonitrile	15.2	76	Total	32.5	1/81	1.12	–0.9
Furfuraldehyde	65	98	84000	50.6	1/455	2.35	122
Phenol	91	100	84000	44.0	1/496		66

Lower critical solution temperatures

*Butyl cellosolve (DEGBE)	55°C
†Methyl ethyl ketone (MEK)	–6°C
‡Tetrahydrofuran (THF)	72°C