

## Common Solvents Used in Organic Chemistry: Table of Properties<sup>1</sup>

Solvent	Formula	MW	Boiling Point (°C)	melting point (°C)	density (g/mL)	Solubility <sup>2</sup>	Dielectric Constant <sup>3</sup>	flash point (°C)
acetic acid	C <sub>2</sub> H <sub>4</sub> O <sub>2</sub>	60.052	118	16.6	1.0446	Miscible	6.20	39
acetone	C <sub>3</sub> H <sub>6</sub> O	58.079	56.05	-94.7	0.7845	Miscible	21.01	-20
acetonitrile	C <sub>2</sub> H <sub>3</sub> N	41.052	81.65	-43.8	0.7857	Miscible	36.64	6
benzene	C <sub>6</sub> H <sub>6</sub>	78.11	80.1	5.5	0.8765	0.18	2.28	-11
1-butanol	C <sub>4</sub> H <sub>10</sub> O	74.12	117.7	-88.6	0.8095	6.3	17.8	37
2-butanol	C <sub>4</sub> H <sub>10</sub> O	74.12	99.5	-88.5	0.8063	15	17.26	24
2-butanone	C <sub>4</sub> H <sub>8</sub> O	72.11	79.6	-86.6	0.7999	25.6	18.6	-9
<i>t</i> -butyl alcohol	C <sub>4</sub> H <sub>10</sub> O	74.12	82.4	25.7	0.7887	Miscible	12.5	11
carbon tetrachloride	CCl <sub>4</sub>	153.82	76.8	-22.6	1.594	0.08	2.24	--
chlorobenzene	C <sub>6</sub> H <sub>5</sub> Cl	112.56	131.7	-45.3	1.1058	0.05	5.69	28
chloroform	CHCl <sub>3</sub>	119.38	61.2	-63.4	1.4788	0.795	4.81	--
cyclohexane	C <sub>6</sub> H <sub>12</sub>	84.16	80.7	6.6	0.7739	0.0055	2.02	-20
1,2-dichloroethane	C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub>	98.96	83.5	-35.7	1.245	0.861	10.42	13
diethylene glycol	C <sub>4</sub> H <sub>10</sub> O <sub>3</sub>	106.12	246	-10	1.1197	10	31.8	124
diethyl ether	C <sub>4</sub> H <sub>10</sub> O	74.12	34.5	-116.2	0.713	7.5	4.267	-45
diglyme (diethylene glycol dimethyl ether)	C <sub>6</sub> H <sub>14</sub> O <sub>3</sub>	134.17	162	-68	0.943	Miscible	7.23	67
1,2-dimethoxyethane (glyme, DME)	C <sub>4</sub> H <sub>10</sub> O <sub>2</sub>	90.12	84.5	-69.2	0.8637	Miscible	7.3	-2
dimethylformamide (DMF)	C <sub>3</sub> H <sub>7</sub> NO	73.09	153	-60.48	0.9445	Miscible	38.25	58
dimethyl sulfoxide (DMSO)	C <sub>2</sub> H <sub>6</sub> OS	78.13	189	18.4	1.092	Miscible	47	95
1,4-dioxane	C <sub>4</sub> H <sub>8</sub> O <sub>2</sub>	88.11	101.1	11.8	1.033	Miscible	2.21(25)	12
ethanol	C <sub>2</sub> H <sub>6</sub> O	46.07	78.5	-114.1	0.789	Miscible	24.6	13
ethyl acetate	C <sub>4</sub> H <sub>8</sub> O <sub>2</sub>	88.11	77	-83.6	0.895	8.7	6(25)	-4
ethylene glycol	C <sub>2</sub> H <sub>6</sub> O <sub>2</sub>	62.07	195	-13	1.115	Miscible	37.7	111
glycerin	C <sub>3</sub> H <sub>8</sub> O <sub>3</sub>	92.09	290	17.8	1.261	Miscible	42.5	160
heptane	C <sub>7</sub> H <sub>16</sub>	100.20	98	-90.6	0.684	0.01	1.92	-4
hexamethylphosphoramide (HMPA)	C <sub>6</sub> H <sub>18</sub> N <sub>3</sub> OP	179.20	232.5	7.2	1.03	Miscible	31.3	105
hexamethylphosphorous triamide (HMPT)	C <sub>6</sub> H <sub>18</sub> N <sub>3</sub> P	163.20	150	-44	0.898	Miscible	??	26
hexane	C <sub>6</sub> H <sub>14</sub>	86.18	69	-95	0.659	0.0014	1.89	-22
methanol	CH <sub>4</sub> O	32.04	64.6	-98	0.791	Miscible	32.6(25)	12
methyl <i>t</i> -butyl ether (MTBE)	C <sub>5</sub> H <sub>12</sub> O	88.15	55.2	-109	0.741	5.1	??	-28
methylene chloride	CH <sub>2</sub> Cl <sub>2</sub>	84.93	39.8	-96.7	1.326	1.32	9.08	--

<i>N</i> -methyl-2-pyrrolidinone (NMP)	CH <sub>5</sub> H <sub>9</sub> NO	99.13	202	-24	1.033	Miscible	32	91
nitromethane	CH <sub>3</sub> NO <sub>2</sub>	61.04	101.2	-29	1.382	9.50	35.9	35
pentane	C <sub>5</sub> H <sub>12</sub>	72.15	36.1	-129.7	0.626	0.04	1.84	-49
petroleum ether (ligroine)	--	--	30-60	-40	0.656	--	--	-30
1-propanol	C <sub>3</sub> H <sub>8</sub> O	60.10	97	-126	0.803	Miscible	20.1(25)	22
2-propanol	C <sub>3</sub> H <sub>8</sub> O	60.10	82.4	-88.5	0.785	Miscible	18.3(25)	12
pyridine	C <sub>5</sub> H <sub>5</sub> N	79.10	115.2	-41.6	0.982	Miscible	12.3(25)	17
tetrahydrofuran (THF)	C <sub>4</sub> H <sub>8</sub> O	72.106	65	-108.4	0.8833	soluble <sup>2</sup>	7.52	-14
toluene	C <sub>7</sub> H <sub>8</sub>	92.14	110.6	-93	0.867	0.05	2.38(25)	4
triethyl amine	C <sub>6</sub> H <sub>15</sub> N	101.19	88.9	-114.7	0.728	0.02	2.4	-11
water	H <sub>2</sub> O	18.02	100.00	0.00	0.998	--	78.54	--
water, heavy	D <sub>2</sub> O	20.03	101.3	4	1.107	Miscible	??	--
<i>o</i> -xylene	C <sub>8</sub> H <sub>10</sub>	106.17	144	-25.2	0.897	Insoluble	2.57	32
<i>m</i> -xylene	C <sub>8</sub> H <sub>10</sub>	106.17	139.1	-47.8	0.868	Insoluble	2.37	27
<i>p</i> -xylene	C <sub>8</sub> H <sub>10</sub>	106.17	138.4	13.3	0.861	Insoluble	2.27	27

#### Notes:

- In 2005, this table was adapted by Dr. Brian J. Myers, Webmaster of [ACS Division of Organic Division \(DOC\)](#) from: [Professor Murov's Organic solvent table](#). The values were obtained from the CRC (87th edition), or Vogel's *Practical Organic Chemistry* (5th ed.).
- Solubilities are in water and are reported as grams solvent/100 grams water. The water solubility of THF is complex. See: [Pubchem](#)
- T = 20 °C unless specified otherwise.
- You can find more detailed information (Health & Safety, Physical, Regulatory, Environmental) on various organic solvents from [Pubchem](#)
- Solvent guides for following Green Chemistry principles are available at: <https://organicchemistrydata.org/gcipr/>
- In 2020, Dr. Joseph Ward, DOC Head Webmaster formatted the table to accommodate a wide range of screens and add sorting to the table. Additionally, it was moved to the DOC's [Organic Chemistry Data](#) Website that was created by Dr. Khoi Van.
- A PDF version of this page is available [here](#).
- Question or comments? Contact [the ACS Organic Division](#)
- This page was updated (table sorting was added): August 9, 2020. Methylene chloride F.P. and DMSO and NMP Water solubility corrected October 2021.
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