

Common Solvents and Non-solvents of Polystyrene



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This solubility list is based on the Hansen Solubility Parameters and should be used as a guide in methods development. The nuances of particle solubility in a given solvent should ultimately be investigated by the experimenter during assay optimization and this guide is not a substitute for bench top evaluation.

Adapted from: Brandrup, J., and E.H. Immergut, eds. 1975. *Polymer Handbook, Second Edition*. New York: John Wiley & Sons, Inc.

Other references include:

Hansen, C. M. (2015). *Hansen Solubility Parameters: A User's Handbook, Second Edition* (2nd ed.). Boca Raton, FL: CRC press.

Burke J. *Solubility Parameters: Theory and Application*. AIC Book and Paper Group Annual 1984;3:13

Microparticle Solubility Based on Hansen Solubility Parameters			
Solvent Class	Solvent	Solubility (S=Soluble, I=Insoluble)	
		Polystyrene	PMMA
Alkanes	n-Butane	I	I
	n-Pentane	I	I
	n-Hexane	I	I
	n-Heptane	I	I
	n-Octane	S	I
	Isooctane	I	I
	n-Dodecane	S	I
	Cyclohexane	S	I
	Methylcyclohexane	S	I
Aromatic Hydrocarbons	Benzene	S	I
	Toluene	S	S
	Napthalene	S	S
	Styrene	S	I
	o-Xylene	S	I
	Ethyl benzene	S	I
	p- Diethyl benzene	S	I
Halohydrocarbons	Chloro methane	S	S
	Methylene chloride	S	S
	1,1 Dichloroethylene	S	S
	Ethylene dichloride	S	S
	Chloroform	S	S
	1,1 Dichloroethane	S	S
	Trichloroethylene	S	S
	Carbon tetrachloride	S	I
	Chlorobenzene	S	S
	o-Dichlorobenzene	S	S
	1,1,2 Trichlorotrifluoroethane	I	I
Ethers	Tetrahydrofuran	S	S
	1,4 Dioxane	S	I
	Diethyl ether	I	I
	Dibenzyl ether	S	S

Ketones	Acetone	S	S
	Methyl ethyl ketone	S	S
	Cyclohexanone	S	S
	Diethyl ketone	S	S
	Acetophenone	S	S
	Methyl isobutyl ketone	S	S
	Methyl isoamyl ketone	S	S
	Isophorone	S	S
Di-(isobutyl) ketone	S	S	
Esters	Ethylene carbonate	I	I
	Methyl acetate	S	S
	Ethyl formate	S	S
	Propylene 1,2 carbonate	S	S
	Ethyl acetate	S	S
	Diethyl carbonate	S	S
	Diethyl sulfate	I	S
	n-Butyl acetate	S	I
	Isobutyl acetate	I	I
	2-Ethoxyethyl acetate	S	S
	Isoamyl acetate	S	I
	Isobutyl isobutyrate	I	I
Nitrogen Compounds	Nitromethane	I	I
	Nitroethane	I	S
	2-Nitropropane	S	S
	Nitrobenzene	S	S
	Ethanolamine	I	S
	Ethylene diem me	S	S
	Pyridine	S	S
	Morpholine	S	S
	Aniline	S	S
	N-Methyl-2-pyrrolidone	S	S
	Cyclohexylamine	S	S
	Quinoline	S	S
	Formamide	I	I
	N,N-Dimethylformamide	S	S
Sulfur Compounds	Carbon disulfide	S	I
	Dimethylsulphoxide	S	S
	Ethanethiol	S	S

Alcohols	Methanol	I	I
	Ethanol	S	S
	Allyl alcohol	S	S
	1-Propanol	S	S
	2-Propanol	S	S
	1-Butanol	S	S
	2-Butanol	S	S
	Isobutanol	I	I
	Benzyl alcohol	S	S
	Cyclohexanol	S	S
	Diacetone alcohol	S	S
	Ethylene glycol monoethyl ether	S	S
	Diethylene glycol monomethyl ether	S	S
	Diethylene glycol monoethyl ether	S	S
	Ethylene glycol monobutyl ether	S	S
	Diethylene glycol monobutyl ether	S	S
1-Decanol	S	S	
Acids	Formic acid	I	I
	Acetic acid	I	I
	Benzoic acid	S	S
	Oleic acid	I	I
	Stearic acid	S	S
Phenols	Phenol	S	S
	Resorcinol	S	S
	m-Cresol	S	S
	Methyl salicylate	S	S
Polyhydric Alcohols	Ethylene glycol	S	S
	Glycerol	S	S
	Propylene glycol	S	S
	Diethylene glycol	I	S
	Triethylene glycol	I	S
	Dipropylene glycol	I	I
Water		I	I

