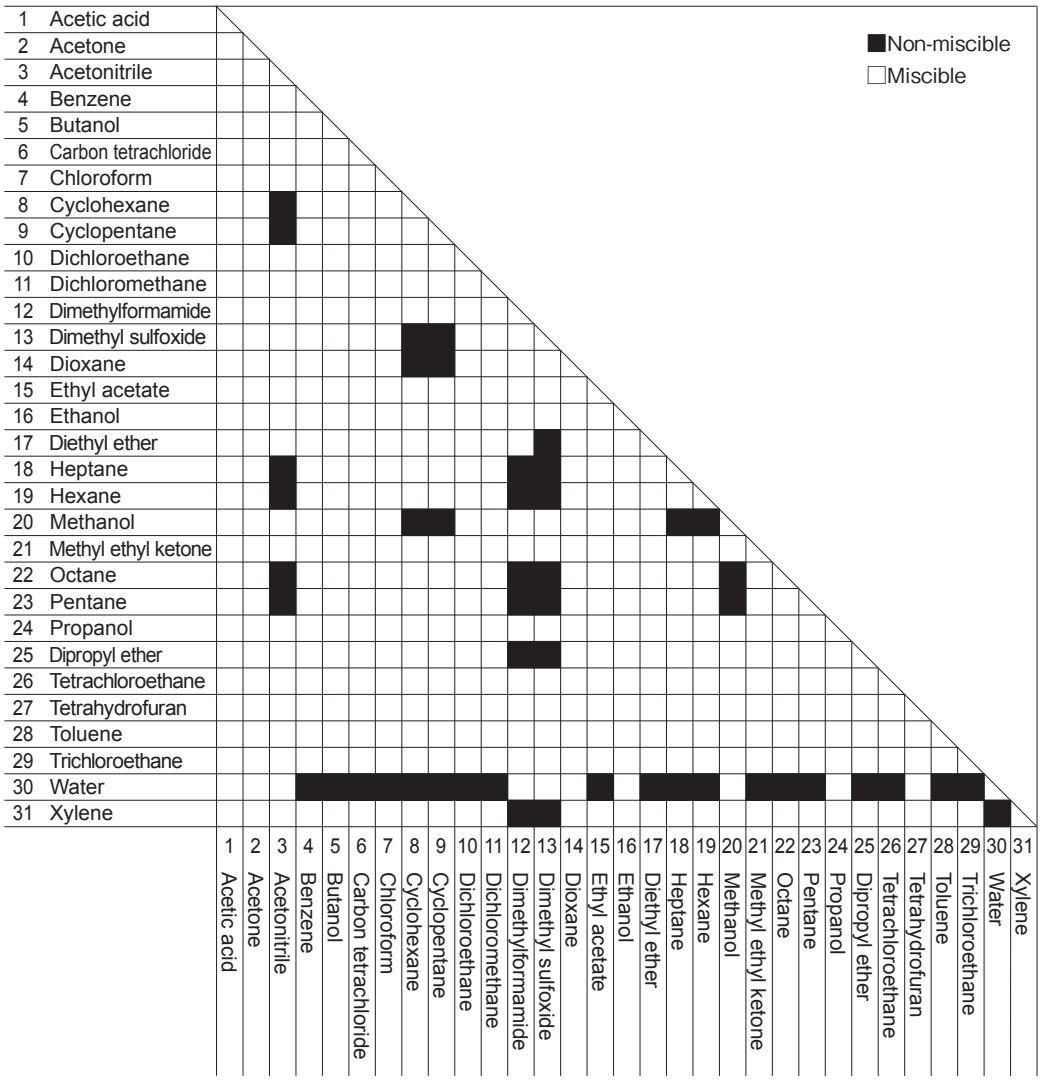
(1) -2 Miscibility of solvents

For preparation of HPLC system, column and mobile phase, the miscibility of each solvent is critical. If non-miscible solvents are used, the column may be deteriorated, and the data reproducibility and system performance may be degraded. If the mobile phases to be replaced with each other are not miscible, replace the solvent with a miscible solvent successively from the HPLC system to the column.



(1) -3 Table of solubility characteristics of solvents

δ : A solubility parameter calculated based on the boiling point indicating the polarity or strength of the solvent. Solvents with high δ can dissolve well polar samples, and solvents with low δ can solve well non-polar samples.

δ_d: A dispersion solubility parameter indicating the degree of selective dissolution of aromatic compounds with -S-, -Cl and -I groups (naphthalene, DDT, hexachlorobenzene, etc.). Solvents with higher δ_d can dissolve compounds better.

δ_o: An orientation (polarity) solubility parameter indicating the degree of selective dissolution of compounds with large dipole moment (nitro compounds, nitriles, ketones, *etc.*).

δ_a: A solubility parameter of proton acceptor indicating the degree of selective dissolution of alcohols, phenols and carboxylic acids

δ_h: A solubility parameter of proton donor indicating the degree of selective dissolution of basic compounds (amines, ethers, SO compounds, *etc.*)

ε°: Solvent strength in adsorption chromatography with alumina

η : Viscosity (mPa·s, 20°C)

Solvent	δ	δ_d	δ_o	δ_a	δ_h	ε°	η
2,2,4-trimethyl-pentane	7.0	7.0	0	0	0	0.01	0.50
n-hexane	7.3	7.3	0	0	0	0.01	0.32
n-heptane	7.4	7.4	0	0	0	0.01	0.41
Cyclohexane	8.2	8.2	0	0	0	0.04	1.00
Carbon tetrachloride	8.6	8.6	0	0.5	0	0.18	0.97
Ethyl acetate	8.6	7.0	3	2	0	0.58	0.45
Toluene	8.9	8.9	0	0.5	0	0.29	0.59
Chloroform	9.1	8.1	3	0.5	0	0.40	0.57
Tetrahydrofuran (THF)	9.1	7.6	4	3	0	0.45	–
Benzene	9.2	9.2	0	0.5	0	0.32	0.65
Acetone	9.4	6.8	5	2.5	0	0.56	0.65
Dichloromethane	9.6	6.4	5.5	0.5	0	0.42	0.44
Chlorobenzene	9.6	9.2	2	0.5	0	0.30	0.80
1,2-dichloroethane	9.7	8.2	4	0	0	0.49	0.79
1,4-dioxane	9.8	7.8	4	3	0	0.56	1.54
1-propanol	10.2	7.2	2.5	4	4	0.82	2.3
Ethanol	11.2	6.8	4.0	5	5	0.88	1.20
N,N-dimethylformamide	11.5	7.9	–	–	–	–	–
Acetonitrile	11.8	6.5	8	2.5	0	0.65	0.37
Methanol	12.9	6.2	5	7.5	7.5	0.95	0.60
Water	21	6.3	High	High	High	–	–