

互溶的溶剂

中国化学化工论坛

在用混合溶剂进行重结晶的时候, 如果溶剂之间的互溶性不好, 在加入不良溶剂的时候, 溶液会分层, 而样品会留在良溶剂中。

经常使用乙醇和水这个搭配, 因为乙醇能溶解许多有机物, 并且乙醇能与水无限混溶。在乙醇中加入水, 可以急剧的降低许多有机物在乙醇中的溶解度, 因此可以用来进行重结晶。当然, 有机溶剂相互之间的搭配也是常使用的。

可以依据相似性原理来选择溶剂。含羟基的化合物, 可以选择水, 甲醇, 乙醇, 乙酸, 丙酮为良溶剂。当然, 良溶剂的相似性不能太高, 否则重结晶损失较大。如果杂质的极性较小, 就可以选择极性较小的不良溶剂, 比如醚, 烷烃类。

三组分以上的混合溶剂的选择余地更大, 甲醇、异丙醚、石油醚, 也可以搭配使用。

下面的列表摘自Purification of Laboratory Chemicals第四版, 该列表没有提到乙酸乙酯和石油醚的互溶性, 不过许多化合物, 也是可以用这个搭配。

Acetic acid: with chloroform, ethanol, ethyl acetate, methyl cyanide, petroleum ether, or water.

Acetone: with benzene, butyl acetate, butyl alcohol, carbon tetrachloride, chloroform, cyclohexane, ethanol,

Ammonia: with ethanol, methanol, pyridine.

Aniline: with acetone, benzene, carbon tetrachloride, ethyl ether, n-heptane, methanol, methyl cyanide or nitrobenzene.

Benzene: with acetone, butyl alcohol, carbon tetrachloride, chloroform, cyclohexane, ethanol, methyl cyanide, petroleum ether or pyridine.

Butyl alcohol: with acetone or ethyl acetate.

Carbon disulphide: with petroleum ether.

Carbon tetrachloride: with cyclohexane.

Chloroform: with acetic acid, acetone, benzene, ethanol, ethyl acetate, hexane, methanol or pyridine.

Cyclohexane: with acetone, benzene, carbon tetrachloride, ethanol or ethyl ether.

Dimethyl formamide: with benzene, ethanol or ether.

Dimethyl sulfoxide: with acetone, benzene, chloroform, ethanol, ethyl ether or water.

Dioxane: with benzene, carbon tetrachloride, chloroform, ethanol, ethyl ether, pet. ether, pyridine or water.

Ethanol: with acetic acid, acetone, benzene, chloroform, cyclohexane, dioxane, ethyl ether, pentane, toluene, water or xylene.

Ethyl acetate: with acetic acid, acetone, butyl alcohol, chloroform, or methanol.

Ethyl ether: with acetone, cyclohexane, ethanol, methanol, methylal, methyl cyanide, pentane or pet.ether.

Glycerol: with ethanol, methanol or water.

Hexane: with benzene, chloroform or ethanol.

Methanol: with chloroform, ethyl ether, glycerol or water.

Methylal: with ethyl ether.

Methyl ethyl ketone: with acetic acid, benzene, ethanol or methanol.

Nitrobenzene: with aniline, methanol or methyl cyanide.

Pentane: with ethanol or ethyl ether.

Petroleum ether: with acetic acid, acetone, benzene, carbon disulphide or ethyl ether.

Phenol: with carbon tetrachloride, ethanol, ethyl ether or xylene.

Pyridine: with acetone, ammonia, benzene, chloroform, dioxane, petroleum ether, toluene or water.

Toluene: with ethanol, ethyl ether or pyridine.

Water: with acetic acid, acetone, ethanol, methanol, or pyridine.

Xylene: with ethanol or phenol.

ethyl acetate, methyl acetate, methyl cyanide, petroleum ether or water.

toluene, water or xylene.

下面的列表摘自<http://home.planet.nl/~skok/techniques/hplc/miscibility.html>

immiscible; miscible.

Acetone	1	
Acetonitrile	2	2
Benzene	3	3
Butanol	4	4
Carbon tetrachloride	5	5
Chloroform	6	6
Cyclohexane	7	7
1,2- Dichloroethane	8	8
Dichloromethane	9	9
Dimethyl formamide	10	10
Dimethyl sulfoxide	11	11
Dioxane	12	12

Ethanol	13	13
Ethyl acetate	14	14
Ethyl ether	15	15
Heptane	16	16
Hexane	17	17
Iso-octane	18	18
Isopropyl alcohol	19	19
Methanol	20	20
Methyl-t-butyl ether	21	21
Methyl ethyl ketone	22	22
Pentane	23	23
Tetrahydrofuran	24	24
Toluene	25	25
Water	26	26
Xylene	27	27
di-iso-propyl ether	28	28

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27

-