

Polarity Tables

Polarity Index

Burdick & Jackson solvents are arranged in order of increasing polarity index, a relative measure of the degree of interaction of the solvent with various polar test solutes.

	Polarity Index (P _r)
Pentane	0.0
1,1,2-Trichlorotrifluoroethane	0.0
Cyclopentane	0.1
Heptane	0.1
Hexane	0.1
Iso-Octane	0.1
Petroleum Ether	0.1
Cyclohexane	0.2
<i>n</i> -Butyl Chloride	1.0
Toluene	2.4
Methyl <i>t</i> -Butyl Ether	2.5
<i>o</i> -Xylene	2.5
Chlorobenzene	2.7
<i>o</i> -Dichlorobenzene	2.7
Ethyl Ether	2.8
Dichloromethane	3.1
Ethylene Dichloride	3.5
<i>n</i> -Butyl Alcohol	3.9
Isopropyl Alcohol	3.9
<i>n</i> -Butyl Acetate	4.0
Isobutyl Alcohol	4.0
Methyl Isoamyl Ketone	4.0
<i>n</i> -Propyl Alcohol	4.0
Tetrahydrofuran	4.0
Chloroform	4.1
Methyl Isobutyl Ketone	4.2
Ethyl Acetate	4.4
Methyl <i>n</i> -Propyl Ketone	4.5
Methyl Ethyl Ketone	4.7
1,4-Dioxane	4.8
Acetone	5.1
Methanol	5.1
Pyridine	5.3
2-Methoxyethanol	5.5
Acetonitrile	5.8
Propylene Carbonate	6.1
<i>N,N</i> -Dimethylformamide	6.4
Dimethyl Acetamide	6.5
<i>N</i> -Methylpyrrolidone	6.7
Dimethyl Sulfoxide	7.2
Water	10.2

Not included:

Table 1 *Kowalska, Teresa & Kaczmarek, Krzysztof & Prus, Wojciech. (2003). Theory and Mechanism of Thin-Layer Chromatography.

Solvent	P'	x_e	x_d	x_n
n-Hexane	0.1			
Cyclohexane	0.2			
Carbon sulfide	0.3			
Carbon tetrachloride	1.6			
Isopropyl ether	2.4	0.48	0.14	0.38
Toluene	2.4	0.25	0.28	0.47
Chlorobenzene	2.7	0.23	0.33	0.44
Benzene	2.7	0.23	0.32	0.45
Diethyl ether	2.8	0.53	0.13	0.34
Chloroform	4.1	0.25	0.41	0.33
Dichloromethane	3.1	0.29	0.18	0.53
Tetrahydrofuran	4.0	0.38	0.20	0.42
1,2-Dichloroethane	3.5	0.30	0.21	0.49
Ethyl methyl ketone	4.7	0.35	0.22	0.43
Acetone	5.1	0.35	0.23	0.42

Table 2 From Chegg

Solvent	Solvent Polarity Index, P
Hexane	0.1
Carbon tetrachloride	1.56
Isopropyl ether	1.83
Toluene	2.4
Methyl- <i>t</i> -butyl ether	2.4
Chloroform	2.7
Diethyl ether	2.8
Dichloromethane	3.1
Isopropanol	3.92
Tetrahydrofuran	4.0
Ethyl Acetate	4.4
Methanol	5.1
Acetone	5.1
Dioxane	5.27
Acetonitrile	5.8
Water	10.2

Table 1. Polarity Indices for Common Liquid Chromatography Solvents

Solvent	Polarity Index (P')
Alkanes and Cyclohexane	0.1
Toluene	2.4
Dichloromethane	3.1
Isopropanol	3.9
Tetrahydrofuran	4
Ethanol	4.3
Ethyl Acetate	4.4
Acetone	5.1
Methanol	5.1
Acetonitrile	5.8
Water	10.2

HPLC –Solvents Polarity for Reverse Phase

Table 6.7 Solvents commonly used with reversed-phase chromatography.

Solvent	<i>P'</i>
Water	10.2
Dimethyl sulfoxide	7.2
Ethylene glycol	6.9
Acetonitrile	5.8
Methanol	5.1
Acetone	5.1
Dioxane	4.8
Ethanol	4.3
Tetrahydrofuran	4.0
Isopropanol	3.9

Data from Snyder and Kirkland [4].

Elutropic Series (ϵ^0) of Some Solvents Used in NPC

Table 25-1

Elutropic series and ultraviolet cutoff wavelengths of solvents for adsorption chromatography on silica

Solvent	Eluent strength (ϵ^0)		Ultraviolet cutoff (nm)
Pentane	0.00	Increasing Polarity ↓	190
Hexane	0.01		195
Heptane	0.01		200
Trichlorotrifluoroethane	0.02		231
Toluene	0.22		284
Chloroform	0.26		245
Dichloromethane	0.30		233
Diethyl ether	0.43		215
Ethyl acetate	0.48		256
Methyl <i>t</i> -butyl ether	0.48		210
Dioxane	0.51		215
Acetonitrile	0.52		190
Acetone	0.53		330
Tetrahydrofuran	0.53		212
2-Propanol	0.60		205
Methanol	0.70		205