




Solid Phase Sorbent Selection


Organic Loading & Exchange Capacity

Reverse Phase (Hydrophobic)				
Sorbent	Structure	% Organic Loading	Applications	
C2 ethyl	-SiCH ₂ CH ₃	6.60	Removes larger or more hydrophobic compounds.	
C3 propyl	-Si(CH ₂) ₂ CH ₃	7.60		
C4 n-butyl	-Si(CH ₂) ₃ CH ₃	8.50		
Ci4 isobutyl	-SiCH ₂ CH(CH ₃) ₂	8.80		
Ct4 tertiary	-SiC(CH ₃) ₃	8.50		
C5 pentyl	-Si(CH ₂) ₄ CH ₃	9.50		
C6 hexyl	-Si(CH ₂) ₅ CH ₃	11.00		
C7 heptyl	-Si(CH ₂) ₆ CH ₃	NOT TESTED		
C8 octyl	-Si(CH ₂) ₇ CH ₃	11.1		
C10 decyl	-Si(CH ₂) ₉ CH ₃	15.70		
C12 dodecyl	-Si(CH ₂) ₁₁ CH ₃	NOT TESTED	Removal of hydrophobic impurities, de-salting and purification of hydrophobic compounds.	
C18 octadecyl	-Si(CH ₂) ₁₇ CH ₃	21.70		
C20 eicosyl	-Si(CH ₂) ₁₉ CH ₃	24.30	Removes smallest or least hydrophobic compounds.	
C30 tricontyl	-Si(CH ₂) ₂₉ CH ₃	26.00		
Cyclohexyl	-Si 	11.60	Scavenger for phenolic compounds.	
Phenyl	-Si 	11.00	Scavenger for polar compounds.	
Normal Phase (Hydrophilic)				
Sorbent	Structure	% Organic Loading	Exchange Capacity (meq/g)	Applications
Silica	-SiOH	N/A	N/A	Removal of hydrophilic (polar) impurities, purification of hydrophilic (polar) compounds.
Diol	-Si(CH ₂) ₃ OCH ₂ -CHOHCH ₂ OH	8.00	N/A	Removal of hydrophilic (polar) impurities, purification of hydrophilic (polar) compounds.
Cyanopropyl	-Si(CH ₂) ₃ CN	6.90	N/A	Removes steroid type compounds.
Florisil®		N/A	N/A	Removes polar type compounds.
Alumina-Acid		N/A	N/A	Removes polar type compounds.
Alumina-Neutral		N/A	N/A	Removes polar type compounds.
Alumina-Base		N/A	N/A	Removes polar type compounds.
Carbon		N/A	N/A	Removes polar type compounds.

Copolymeric (Multifunctional Phases)

Sorbent	Structure	% Organic Loading	Exchange Capacity (meq/g)	Applications
Aminopropyl + C8	$-\text{Si}(\text{CH}_2)_3\text{NH}_2$ & $-\text{Si}(\text{CH}_2)_7\text{CH}_3$	12.3	0.163	Dual functionality for strong acids and hydrophobic compounds.
Quaternary Amine + C8	$-\text{Si}(\text{CH}_2)_3\text{N}^+(\text{CH}_3)_3$ & $-\text{Si}(\text{CH}_2)_7\text{CH}_3$	13.60	0.160	Dual functionality for weak acids and hydrophobic compounds.
Carboxylic Acid + C8	$-\text{SiCH}_2\text{COOH}$ & $-\text{Si}(\text{CH}_2)_7\text{CH}_3$	12.50	0.105	Dual functionality for strong base and hydrophobic compounds.
Propylsulfonic Acid + C8	$-\text{Si}(\text{CH}_2)_3\text{SO}_3\text{H}$ & $-\text{Si}(\text{CH}_2)_7\text{CH}_3$	14.62	0.114	Dual functionality for weak bases and hydrophobic compounds.
Benzenesulfonic Acid + C8	$-\text{Si}(\text{CH}_2)_2$  $-\text{SO}_3\text{H}$ & $-\text{Si}(\text{CH}_2)_7\text{CH}_3$	12.30	0.072	Dual functionality for weak bases and hydrophobic compounds.
Cyanopropyl + C8	$-\text{Si}(\text{CH}_2)_3\text{CN}$ & $-\text{Si}(\text{CH}_2)_7\text{CH}_3$	14.60	0.163	Dual functionality for polar and hydrophobic compounds.
Cyclohexyl + C8	$-\text{Si}$  & $-\text{Si}(\text{CH}_2)_7\text{CH}_3$	N/A	N/A	Dual functionality for phenols and hydrophobic compounds.



Covalent Phases

Sorbent	Structure	% Organic Loading	Exchange Capacity (meq/g)	Applications
Epoxy	$-\text{Si}(\text{CH}_2)_3 - \text{O} - \text{CH}_2 - \text{CH} - \text{CH}_2$ 	N/A	N/A	Covalent bond formation with proteins, amines and other nucleophiles.
Aldehyde	$-\text{Si}(\text{CH}_2)_4\text{CHO}$	N/A	N/A	Scavenger for primary amines, hydrazines, reducing agents and other nucleophiles. Covalent bonding for proteins, enzymes and other bioactive molecules.
Isocyanate	$-\text{Si}(\text{CH}_2)_3\text{NCO}$	7.1	N/A	Scavenger for amines, alkoxides and other nucleophiles.
Thiopropyl	$-\text{Si}(\text{CH}_2)_3\text{SH}$	6.50	N/A	Scavenger for alkylating agents, alcohols and amines.

Ion Exchange - Anion

Sorbent	Structure	pK _a	% Organic Loading	Exchange Capacity (meq/g)	Applications
Aminopropyl (1° amine)	-Si(CH ₂) ₃ NH ₂	9.8	6.65	0.310	Scavenger for acids, cyclic compounds, cholesterols, and other lipid type compounds.
N-2 Aminoethyl (1° & 2° amine)	-Si(CH ₂) ₃ NH(CH ₂) ₂ NH ₂	10.1, 10.9	9.70	0.320	Scavenger for acids, cyclic compounds, cholesterols, and other lipid type compounds.
Diethylamino (3° amine)	-Si(CH ₂) ₃ N(CH ₂ CH ₃) ₂	10.6	8.40	0.280	Scavenger for acids, cyclic compounds, cholesterols, and other lipid type compounds.
Quaternary Amine with Chloride counter ion	-Si(CH ₂) ₃ N ⁺ (CH ₃) ₃ Cl ⁻	Always Charged	8.40	0.250	Scavenger for acids and sulfonyl chlorides, isocyanates and weak electrophiles. Useful when charge on ion being removed is stronger than the chloride counter ion.
Quaternary Amine with Acetate counter ion	-Si(CH ₂) ₃ N ⁺ (CH ₃) ₃ CH ₃ CO ₂ ⁻	Always Charged	8.40	0.250	Scavenger for acids and sulfonyl chlorides, isocyanates and weak electrophiles. Useful when charge on ion being removed is stronger than the acetate counter ion.
Quaternary Amine with Hydroxide counter ion	-Si(CH ₂) ₃ N ⁺ CH ₃) ₃ OH ⁻	Always Charged	8.40	0.250	Scavenger for acids and sulfonyl chlorides, isocyanates and weak electrophiles. Useful when charge on ion being removed is stronger than the hydroxide counter ion.
Quaternary Amine with Formate counter ion	-Si(CH ₂) ₃ N ⁺ (CH ₃) ₃ CHO ₂ ⁻	Always Charged	8.40	0.250	Scavenger for acids and sulfonyl chlorides, isocyanates and weak electrophiles. Useful when charge on ion being removed is stronger than the formate counter ion.
Polyimine	-Si(CH ₂) ₃ -R-[NHCH ₂ CH ₂] _x		13.5	0.88	Scavenger for acids, sulfonyl chlorides, isocyanates and other electrophiles.

Ion Exchange - Cation

Sorbent	Structure	pK _a	% Organic Loading	Exchange Capacity (meq/g)	Applications
Carboxylic Acid	-SiCH ₂ COOH	4.8	9.10	0.170	Scavenger for strong amines with quats.
Propylsulfonic Acid	-Si(CH ₂) ₃ SO ₃ H	<1	7.10	0.180	Scavenger for amines, alcohols and other nucleophiles.
Benzenesulfonic Acid	-Si-(CH ₂) ₂ -  -SO ₃ H	Always Charged	11.00	0.320	Scavenger for amines, alcohols and other nucleophiles.
Benzenesulfonic Acid High Load	-Si-(CH ₂) ₂ -  -SO ₃ H	Always Charged	15.00	0.650	Scavenger for amines, alcohols and other nucleophiles.
Triacetic Acid	-Si(CH ₂) ₃ NH-(CH ₂) ₂ -N(CH ₂ COOH) ₂ CH ₂ COOH		7.61	Anion 0.17 Cation 0.06	Chelator for metal ions.