SOLID PHASE EXTRACTION

Material Solutions. Uncompromising Integrity.

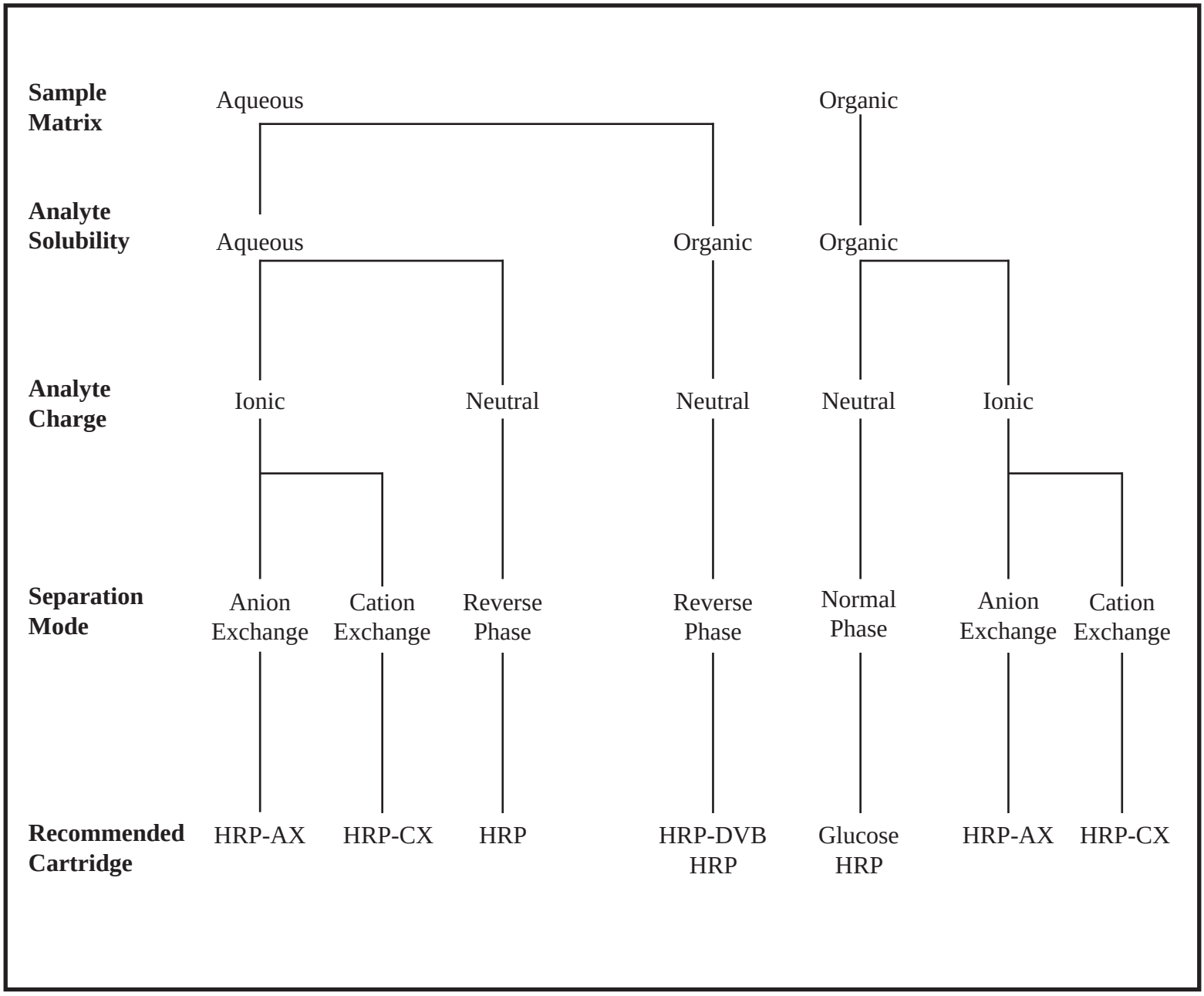
JORDI

Hydroclean™ - SPE Method Development

SPE Polymer Phase Selection

Jordi solid phase extraction cartridges allow for separations by reverse phase, normal phase, anion exchange, cation exchange and mixed modes.

The diagram below is intended to simplify the process of selecting the right SPE product for your application.



Jordi SPE Method Development

Choosing the Right Cartridge

Cartridge Size—Sample Capacity

Sizes: 1 mL, 3 mL, 6 mL, 60 mL
(Specialty sizes available upon request)
The SPE Cartidge determines the volume of the sample solution, which can be loaded onto the sorbent bed in a single step.

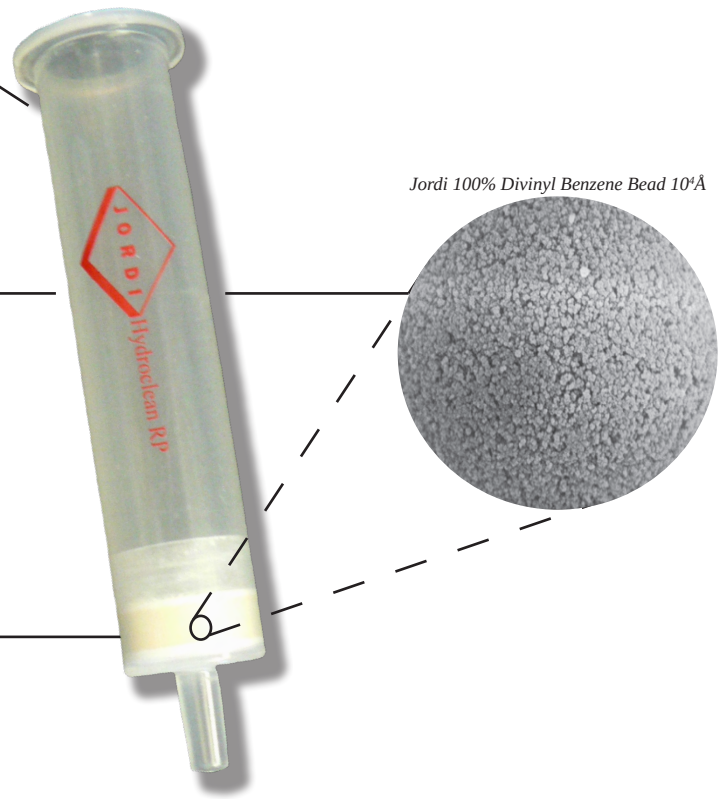
Pore Size—the mean diameter of the pores on the sorbent particle surface

The analyte molecule in an SPE method should fit easily through the pores of the sorbent (i.e. for large molecules, a sorbent particle with extra large pores should be selected).

Resin Bed Mass—Analyte Capacity

Sizes: 10 mg, 30 mg, 60 mg, 200 mg, 1 g
(Specialty bed weights available upon request)
The resin bed mass determines the maximum amount of analyte retained by the sorbent.

Tip: Choosing the proper bed mass reduces leaching of sample components



Tips for Choosing Proper Resin Mass

Polymeric Sorbents—polymeric resins provide larger surface area than silica-based resins, offering higher capacity on the order of 10-15% of the resin mass. This allows for the use of smaller bed volumes and improved detection limits.

Ion Exchange Sorbents—the number of charged sites on the resin available to interact with the analyte determines capacity.

Tip: Choosing a slightly larger resin mass is advisable, since most SPE samples are loaded with contaminants and interferences

Resin Bed Volume—interstitial volume plus pore volume

The resin bed volume controls the minimum solvent volume in an SPE method. To successfully condition, wash and elute from the cartridge, using solvent volumes 4 to 8 times that of the sorbent bed is typically sufficient. Using less than 4 to 8 sorbent bed volumes contributes to incomplete solvation and low, inconsistent recoveries.

Tip: Polymeric SPE products usually require 200-250 uL per 100 mg of sorbent

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General SPE Methods

	Reversed Phase SPE Method		*Normal Phase SPE Method*		*Ion Exchange SPE*	
Sorbent	DVB, HRP		Glucose, HRP		Anion Exchange (HRP-AX) Cation Exchange (HRP-CX)	
Analyte Properties	• Non-polar to moderately polar Hydrophobic • Neutral	Pharmaceuticals, pesticides, herbicides	• Moderate to highly polar • Neutral	Pesticides	Charged/Ionized compounds	• Anion exchange (acidic) analytes • Cation exchange (basic) analytes
Sample/ Matrix	Aqueous—diluted with buffer	Biological fluids, water	Non-polar to moderately polar organic	Hexane, chloroform, petroleum ether, toluene or methylene chloride	Aqueous—low ionic strength buffers (<30mM), pH adjusted	Biological fluids with buffer
Conditioning	1. Solvation: polar organic solvents 2. Equilibration: aqueous/ buffer solutions	1. Methanol 2. Water or buffer	Solvation— sample/ matrix solvent	Hexane or chloroform	1. Conditioning—polar organic solvents 2. Equilibration—low ionic strength buffers, pH adjusted	1. Methanol 2. Water 3. 0.1M HCL
Washing	Aqueous buffer plus 5-50% polar organic solvent	Methanol/water (1:9)	Non-polar organic solvents with 1-5% of moderate to low polarity organic solvents	Hexane with 1% THF, ethyl acetate, acetone, acetonitrile or IPA	Aqueous buffers of low ionic strength with organic solvent (optional)	1. *Anion exchange* Methanol, 0.5M HCl, Acetic Acid 2. *Cation exchange* DCM/IPA/NH_4OH (78:20:2)
Elution	Polar or non-polar organic solvent(s) plus (optional): • Water buffer solution • Strong acid or base	Methanol with Ammonium Acetate	Non-polar organic solvents containing 5-50% of moderate to high polarity organic solvents	Hexane with 10% THF, ethyl acetate, acetone, acetonitrile or IPA	• Neutralize weak anion or cation • Increase ionic strength and counter ion concentration • Add strong counter ion displacer	1. *Anion exchange* Methanol, 0.5M HCl, Acetic Acid 2. *Cation exchange* DCM/IPA/NH_4OH (78:20:2)

Sorbent Wash and Elution Solvent Volumes*		
Polymeric Sorbent Mass	Minimum Recommended Solvent Volumes	Maximum Recommended Solvent Volumes
10 mg	100 uL	200 uL
30 mg	300 uL	600 uL
60 mg	600 uL	1.2 mL
200 mg	2 mL	4 mL
1 g	10 mL	20 mL

Polymeric gels provide larger surface area that requires larger solvent volumes per gram of sorbent. Elution volumes depend on the chemical nature of the analyte, its relative concentration in the matrix, the chemistry of the solution solvent and the sorbent bed mass. Please be advised that the table above outlines a generic SPE method.* ***Call the experts at Jordi for a consultation today.*

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