



## Discovery Ion-Exchange SPE Products

**Base Silica:** Irregular shaped, acid washed; 50µm particle size, 70Å pore diameter, 480m<sup>2</sup>/g specific surface area, 0.9cm<sup>3</sup>/g pore volume

Discovery ion-exchange SPE products are specifically developed, tested and quality controlled for pharmaceutical and clinical applications. The Discovery ion-exchange product line offers excellent selectivity towards charged molecular species enabling the user to extract, isolate, purify, and concentrate charged ionizable pharmaceuticals (basic or acidic) from both polar and non-polar sample matrices.

- Switches sample matrices and protects the analytical column/instrument from unwanted sample matrix components
- Concentrates target analyte(s) and removes background interferences for increased sensitivity and accuracy
- Improve extraction selectivity through Discovery's narrower pore size distribution
- Acid washed to reduced metal chelating activity
- Excellent capacity for the baseline clean-up of solution phase combinatorial chemistry reactions (removing target molecules from reaction by-products and excess reagents)

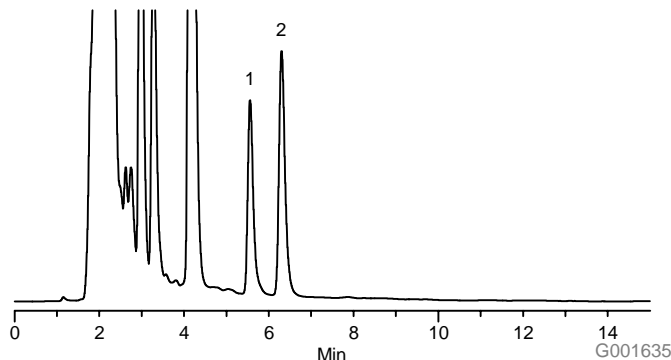
A comprehensive line of ion-exchange chemistries (four different SPE chemistries) and hardware configurations (including 96-well plates) to meet your diverse and most demanding sample prep needs.

<p><b>DSC-NH<sub>2</sub></b></p> $\begin{array}{c}   \\ \text{--- Si ---} \\   \end{array} \text{---} (\text{CH}_2)_3\text{NH}_2$ <p style="text-align: right; font-size: small;">G001631</p>	<ul style="list-style-type: none"> <li>– Polymerically bonded, aminopropyl phase that is very polar in nature (hydrogen bonding) allowing for both normal phase and ion exchange applications</li> <li>– A weak anion exchanger with a pKa of 9.8. At pH 7.8 or below, the functional groups are positively charged</li> <li>– Allows the rapid release of very strong anions such as sulfonic acids that may be retained irreversibly on SAX (a quarternary amine sorbent that is always positively charged)</li> <li>– Can be used in some reversed phase applications (due to ethyl spacer); however, it is predominately used as an ion-exchanger or normal phase sorbent due to its polar nature</li> </ul>
<p><b>DSC-SAX</b></p> $\begin{array}{c}   \\ \text{--- Si ---} \\   \end{array} \text{---} (\text{CH}_2)_3\text{N}^+(\text{CH}_3)_3$ <p style="text-align: right; font-size: small;">G001629</p>	<ul style="list-style-type: none"> <li>– A polymerically bonded quarternary amine that remains charged at all pH levels</li> <li>– Commonly used when extracting weaker cations (e.g., carboxylic acids) that may not bind strongly enough to weaker anion-exchangers</li> <li>– Selectivity can be modified by changing the counter ion with the appropriate buffer during conditioning</li> </ul>
<p><b>DSC-WCX</b></p> $\begin{array}{c}   \\ \text{--- Si ---} \\   \end{array} \text{---} (\text{CH}_2)_3\text{N}(\text{CH}_2\text{COONa})\text{CH}_2\text{CH}_2\text{N}(\text{CH}_2\text{COONa})_2$ <p style="text-align: right; font-size: small;">G001632</p>	<ul style="list-style-type: none"> <li>– A polymerically bonded carboxy propyl phase with a Na counter ion and a pKa of 4.8</li> <li>– Its weak cation exchange properties carries a negative charge at pH 6.8 or above</li> <li>– A pH of 2.8 or below neutralizes this phase for easier elution of strong cationic analytes that are neutralized only at extreme basic conditions</li> <li>– Typically used when dealing with very strong cationic (high pKa) compounds that may be irreversibly retained on strong cation exchangers</li> </ul>
<p><b>DSC-SCX</b></p> $\begin{array}{c}   \\ \text{--- Si ---} \\   \end{array} \text{---} (\text{CH}_2)_2 \text{---} \text{C}_6\text{H}_4 \text{---} \text{SO}_3^- \text{H}^+$ <p style="text-align: right; font-size: small;">G001630</p>	<ul style="list-style-type: none"> <li>– A polymerically bonded, benzene sulfonic acid functional group with a H<sup>+</sup> counter ion that is a strong cation exchanger due to its very low pKa (&lt;1.0)</li> <li>– Silica support allows for use with very organic solvents (no shrinking/swelling)</li> <li>– Excellent capacity (0.8meq/g) for cleaning up solution phase combinatorial chemistry reactions (removing target molecules from reaction by-products and excess reagents)</li> <li>– The presence of the benzene ring offers some mixed-mode capabilities (hydrophobic interactions) that should be considered when extracting cations from aqueous matrices</li> </ul>

## Here's the Proof:

### Competitor Comparison of 3-methylpyrazole and 4-methylpyrazole from Urine Using Discovery DSC-SCX

**SPE Tube:** Discovery DSC-SCX, 500mg/3mL  
**HPLC Column:** Discovery C18, 15cm x 4.6mm, 5µm particle, preceded by a 2cm guard column and 0.5µm frit filter  
**Mobile Phase:** MeOH:5mM phosphate buffer, pH 6 (20:80)  
**Flow Rate:** 1mL/min  
**Temp.:** 30°C  
**Det.:** UV, 220nm  
**Inj.:** 25µL diluted urine extract



#### Efficiency of Recovery

Compound (µg/mL)	Discovery DSC-SCX (n=3)		Leading Competitor SCX (n=2)	
	%Recovery	%RSD	%Recovery	%RSD
1. 3-methylpyrazole (1.0)	89.4	±10.2%	67.1	±20%
2. Aprobarbital (1.0)	79.4	±6.8%	50.5	±30%

#### SPE Procedure

1. Condition and Equilibrate with 2mL MeOH & 2mL DI water
2. Load 1mL urine sample spiked with 1µg/mL of each analyte
3. Wash w/ 2mL DI Water
4. Elute with 2mL 5% MeOH in 250mM phosphate buffer, pH 7.4
5. Quantify against external standards via HPLC analyses

## Ordering Information:

### Discovery Ion-Exchange SPE Products

Product	Qty./Pk	DSC-NH <sub>2</sub>	DSC-SAX	DSC-WCX	DSC-SCX
<b>Discovery SPE Tubes</b>					
50mg/1mL	108 qty/pk	52635-U	52661-U	52737-U	52684-U
100mg/1mL	108 qty/pk	52636-U	52662-U	52739-U	52685-U
500mg/3mL	54 qty/pk	52637-U	52664-U	52741-U	52686-U
500mg/6mL	30 qty/pk	52638-U	52665-U	52742-U	52688-U
1g/6mL	30 qty/pk	52640-U	52666-U	52743-U	52689-U
2g/12mL	30 qty/pk	52641-U	52677-U	52744-U	52690-U
5g/20mL	20 qty/pk	52642-U	52688-U	52745-U	52691-U
10g/60mL	20 qty/pk	52644-U	52699-U	52746-U	52692-U
Bulk packing	100g	57212-U	57214-U	57228-U	57221-U
<b>Discovery SPE-96 Well Plates</b>					
100mg/well	1 ea	575615-U	575618-U	575633-U	575621-U
50mg/well	1 ea	575616-U	575619-U	575634-U	575622-U
25mg/well	1 ea	575617-U	575620-U	575635-U	575623-U
<b>Discovery Büchner Funnels</b>					
55mm ID x 30mm H, 12.5g	6 qty/pk	Custom	Custom	Custom	Custom
70mm ID x 40mm H, 25g	6 qty/pk	Custom	Custom	Custom	Custom
90mm ID x 48mm H, 50g	6 qty/pk	Custom	Custom	Custom	Custom
110mm ID x 66mm H, 100g	6 qty/pk	Custom	Custom	Custom	Custom

#### Trademark

Discovery is a trademark of Sigma-Aldrich Co.

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