Orpheus

Silica based SPE sorbents

OROCHEM
Molecular Purification by Design

Sorbent Selection:

Reversed Phases

- C1
- C2
- C8
- C18
- Phenyl
- Cyclohexyl

Polar Phases

- Silica
- Diol
- Cyanopropyl
- Alumina
- Amino
- Florisil

Ion Exchange Phases

- SCX
- SAX
- Diethyl Aminopropyl (DEAP– WAX)
- Carboxylic Acid (CBA-WCX)

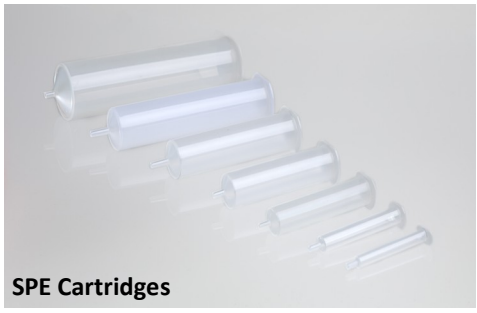
Features:

- Available in all product formats (discs and packed particle bed cartridges, columns, 96 and 384 well plates)
- Broader analyte selectivity via retention of both hydrophobic and hydrophilic moieties due to hydrophilic character of bonded particle
- Less Silanol activity
- Available in 60-300 Å porosities
- Wide varieties of phases: Non-polar, Ion Exchanged, Mixed Modes

Applications:

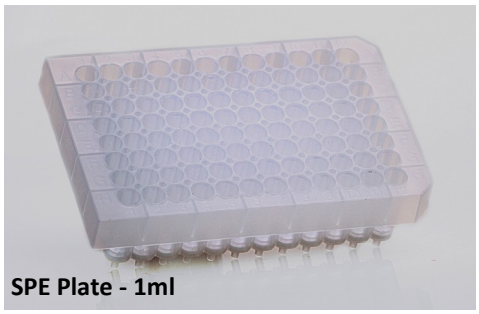
- Specific phases for routine extractions of drugs of abuse from biological fluids
- Highest mass cartridges for extractions of environmental samples.

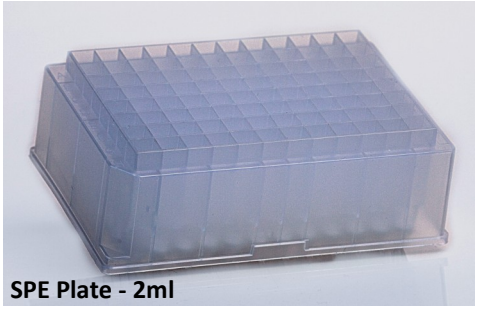
Formats:


SPE Cartridges


LRC Columns


Snap Cap Cartridges


SPE Plate - 1ml


SPE Plate - 2ml

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Evaluation Model for Identification of Distinctive Silanol Variations in SPE Sorbents Used for LC-MS/MS Bioanalytical Sample Preparation

Introduction:

Solid-phase extraction (SPE) is a powerful sample preparation method to isolate pure analyte and minimize ion suppression from matrix components when using LC-MS/MS techniques. Successful use of bonded silica sorbents often requires extensive time in method development to overcome secondary effects on the silica surface. Elution solvents with triethylamine (TEA) are often required to disrupt strong silanol retention. Rapid "on/off" sample preparation prefers solvent modifications be unnecessary and that elution be performed with common organic solvents for compatibility with MS. We designed an evaluation model using probes to characterize silanol content. Most importantly, significant differences have been shown to exist in spite of end capping.

Methods

A collection of branded sorbent particles (C8 and C18 bonded silica) was evaluated for their relative silanol content in a simple model using three probes dissolved in water: amitriptyline (50 ug/mL), acetylsalicylic acid (10 ug/mL) and Azure A (2 ug/mL). Following SPE cartridge (200 mg/3 mL size) conditioning, analyte probes were loaded and washed with water; both

Preliminary Data

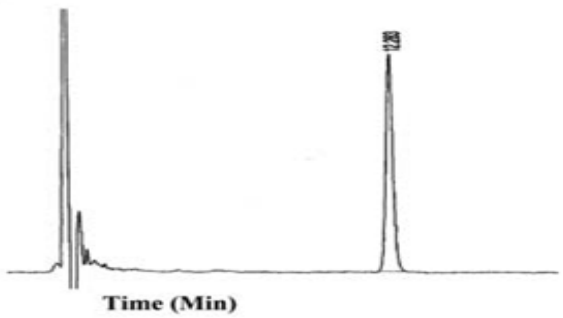
Elution of amitriptyline (basic amine-containing probe) from C8 and C18 sorbents often requires a TEA-modified solvent to disrupt silanol interactions. Examination of elutes from different SPE sorbents clearly showed distinct differences among brands. Two C8 types eluted amitriptyline with pure acetonitrile (24% and 62% recovery), while two others showed no recovery (high silanol content), and two additional brands did elute using TEA in organic solvent. Among seven C18 silica types, one showed 91% recovery using acetonitrile elution, two showed 20% and 22% recovery, and the remaining displayed no recovery.

Retention of acetyl salicylic acid (a carboxylic acid probe) on C8, C18 and silica were compared. Breakthrough was 100% for silica, while four C8 brands showed 0%, 0%, 5% and 68%; clear differences in silanol content were demonstrated. Seven C18 brands revealed breakthrough percentages of 25%, 25%, 43%, 45%, 65%, 88% and 98%, confirming sorbent diversity.

Retention of Azure A (aromatic amine-containing probe) on the same sorbents was also compared. On two sorbents the dye eluted with 20% acetonitrile in water; the remaining required TEA-modified acetonitrile.

Retention and Elution of Amitriptyline applied to C18

Sorbent	Breakthrough%	Elute Ch3CN%	Elute Mobile Phase w/TEA %
Orochem	0	91	9
Sorbent B	0	0	100
Sorbent Z	0	20	80
Sorbent R	0	0	100
Sorbent C	0	0	100
Sorbent A	0	0	100
Sorbent M	0	22	78



Retention of Acetylsalicylic Acid on C8 Not- Endcapped Sorbents

Sorbent	Breakthrough
Silica	10 µg/ml
Orochem 1	0%
Orochem 2 Polar	0%
Sorbent Z	6.8% µg/ml
Sorbent S	0.54 µg/ml

Retention of Acetylsalicylic Acid on C18 Not- Endcapped Sorbents

Sorbent	Breakthrough µg/ml
Silica	10
Orochem	2.5
Sorbent Z	4.3
Sorbent R	4.5
Sorbent B	8.8
Sorbent C	6.5
Sorbent A	9.6