

Bond Elut Plexa Solid Phase Extraction Cartridges

Technical Overview

General Description

Bond Elut is the original and most trusted name in solid phase extraction. Years of use by companies worldwide have thoroughly documented its many applications and proven its properties. There are more literature references for Bond Elut than any other SPE product in the industry.

Bond Elut Plexa is the next generation of polymeric SPE products designed for simplicity, improved analytical performance, and ease-of-use. Its hydroxylated exterior and advanced polymeric architecture make this product unique.

Regardless of the application or sample type, Bond Elut Plexa makes a difference. Methods are simple, flow characteristics are superior, and analytical performance is improved, leading to easier validation.

Simple methods deliver clean extracts and high recoveries from a wide range of acidic, basic, and neutral analytes. The advanced polymeric design effectively eliminates the common matrix interferences that cause ion suppression, resulting in improved analytical sensitivity and data quality.

Bond Elut Plexa improves SPE to produce better information faster.

SPE is an integral sample preparation technique in the analytical workflow of complex samples. Even with the adoption of highly selective detectors, LC/MS/MS or GC/MS/MS, ion suppression from coeluting impurities can adversely affect quantitative analyses. A clean extract directly correlates to less complicated analysis conditions, longer column life, and more accurate results. SPE is the preferred sample preparation technique compared to LLE, Protein PPT, or SPME because it offers greater flexibility, more reproducible recoveries, reduced solvent cost, effective cleanup, and easy automation. SPE sample preparations are used by researchers in the pharmaceutical, forensic, food safety, and environmental sector.



Agilent Technologies

Quality Controls

Every Bond Elut product undergoes a series of carefully conducted analyses prior to acceptance and shipment to our customers. Our certificate of analysis provides the results of some of the critical performance tests used for the evaluation of each of our sorbent lots. In addition, usage testing of each lot reflects tighter acceptance ranges of critical parameters, ensuring reproducible results during sample processing. The Bond Elut Plexa certificate of performance indicates the stringent acceptance range and documents lots within the range. All of the manufacturing and testing processes used in the preparation and evaluation of this product are in accordance with an ISO 9001:2000 regulated Quality Management System. As a result, Bond Elut SPE phases are designed with an even higher degree of consistency and reproducibility.

Operational Guidelines

Bond Elut Plexa simplifies sample processing in two ways. A wide range of analyte types can be extracted with just two general purpose methods. Even polar bases are recovered with high efficiency. This simplifies sorbent selection and method development. It also improves performance and sensitivity, and streamlines method validation.

pKa		
2	6	10
Acidic Method optimized for Acids		Basic Method optimized for Bases and Neutrals
1. Condition: 500 μ L CH ₃ OH, followed by 500 μ L water		1. Condition: 500 μ L CH ₃ OH, followed by 500 μ L water
2. Apply 100 μ L plasma diluted 1:3 with 1% formic acid		2. Apply 100 μ L plasma diluted 1:3 with 2% NH ₄ OH
3. Wash: 500 μ L 5% CH ₃ OH		3. Wash: 500 μ L 5% CH ₃ OH
4. Elute: 500 μ L CH ₃ OH		4. Elute: 500 μ L CH ₃ OH

Comparison of Bond Elut Plexa with Agilent SampliQ OPT

The first evaluation uses Bond Elut application note 00602, *Extraction of acidic drugs from plasma with polymeric SPE sorbent Bond Elut Plexa* as the basis of comparison. Figure 1 illustrates the analysis results.

Sample Prep

1. Sample 5 mL human plasma.
2. Spike with 200 μ L of standard mix, and vortex.
3. Dilute with 15 mL 1% formic acid.

SPE Method

1. Condition with 3 mL of methanol.
2. Condition with 3 mL of water.
3. Load 1 mL spiked, diluted plasma.
4. Wash with 3 mL of 5% methanol.
5. Elute with 3 mL of methanol.
6. Dry and reconstitute with 1 mL of 80:20 A:B.

HPLC Conditions

Mobile phase: A: 20 mM ammonium acetate in water
B: 20 mM ammonium acetate in 10:90 water:acetonitrile

Gradient program: Time (minute) %B
0:0 2
18.0 75
18.1 2

Column: Agilent ZORBAX Rapid Resolution Eclipse Plus C18, 4.6 mm × 150 mm,
3.5 μm (p/n 959963-902)

Detection DAD: 254 nm

Compounds of interest

Spike solution concentration approximately 50 μg/mL, 200 μL spike equivalent to approximately 10 μg of analyte

	Log P	pKa
2-Naphthalenesulfonic acid	0.63	1.29
Indoprofen	2.77	5.45
Ketoprofen	0.97	5.94
Naproxen	4.15	3.18

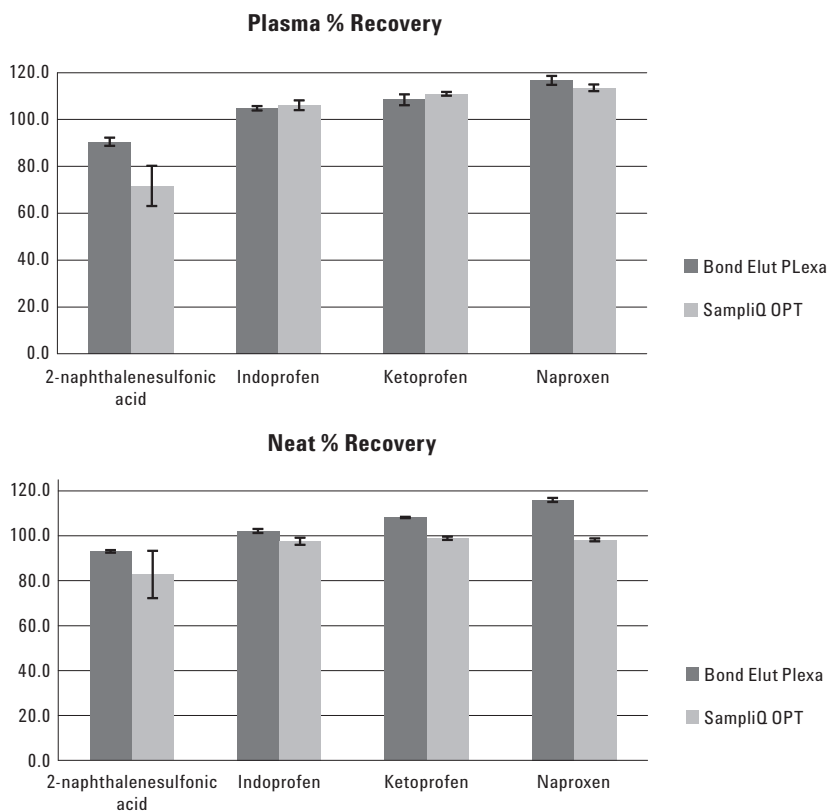


Figure 1. Comparison of Bond Elut Plexa and SampliQ OPT recoveries from a human plasma and aqueous spiked samples.

The second evaluation uses Agilent's application note 5989-8869EN; *New polymer solid phase extraction cartridges: SampliQ OPT* as the basis of comparison. Figure 2 illustrates the results.

Sample Prep

1. Sample 5 mL human plasma.
2. Spike with 200 μ L of standard mix, and vortex.
3. Dilute with 15 mL of 1% formic acid.

SPE Method

1. Condition with 3 mL of methanol.
2. Condition with 3 mL of water.
3. Load 1 mL spiked, diluted plasma, and dry < 1 minute.
4. Wash with 1 mL 5% to 10% methanol in water, and dry < 1 minute.
5. Elute with 2 mL of methanol or 0.1% formic acid in methanol.
6. Dry and reconstitute with 1 mL of 98:2 A:B.

HPLC Conditions

Mobile phase:	A: 20 mM ammonium acetate in water B: 20 mM ammonium acetate in 10:90 water:acetonitrile
Gradient program:	Time (minute) %B 0:0 2 25 75 25.1 2
Column:	Agilent ZORBAX Rapid Resolution Eclipse Plus C18, 4.6 mm \times 150 mm, 3.5 μ m (p/n 959963-902)
Detection DAD:	230 and 254 nm

Compounds of interest

Spike solution concentration approximately 50 μ g/mL, 200 μ L spike equivalent to approximately 10 μ g of analyte

	Log P	pKa
Acetaminophen	0.46	9.4
2,7 dihydroxy naphthalene	2.2	9.4
Doxepin hydrochloride	3.86	8

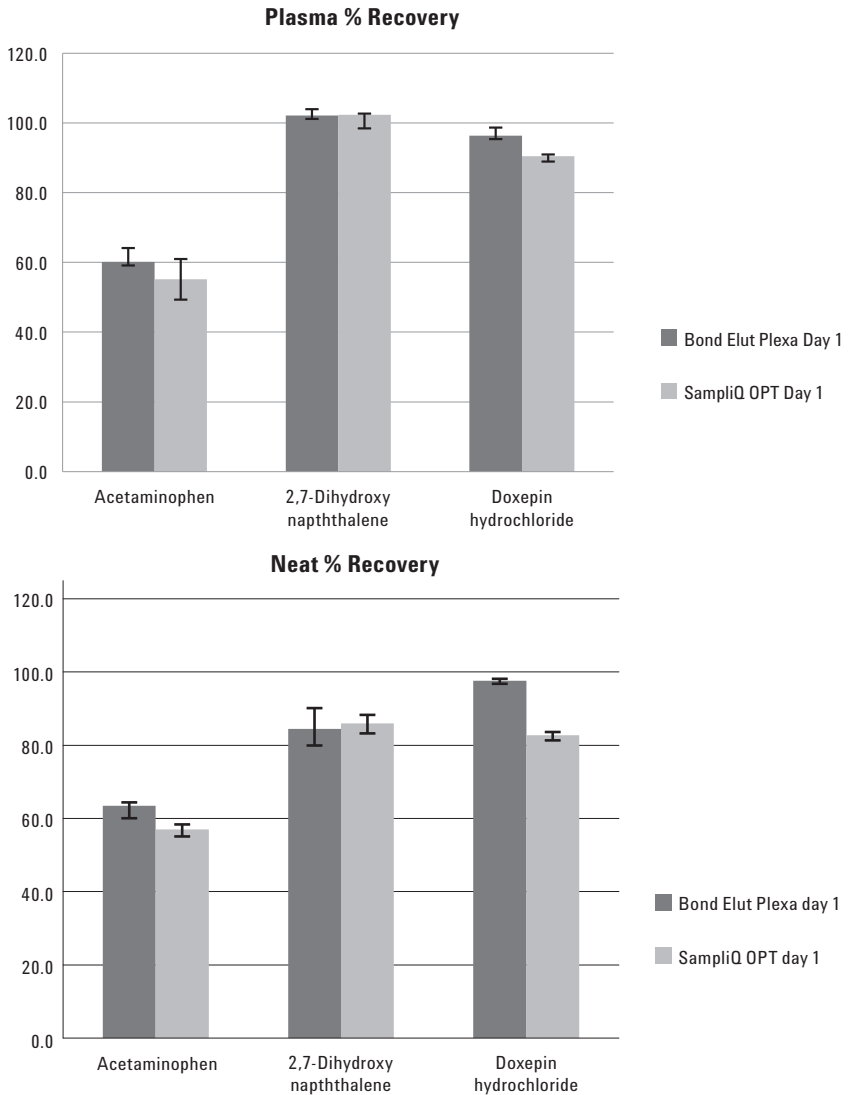


Figure 2. Comparison of Bond Elut Plexa and SampliQ OPT recoveries from a human plasma and aqueous neat spiked samples.

Conclusion

Bond Elut Plexa polymer technology comprises a new generation of SPE products designed for simple method development, ease-of-use and improved analytical performance. Bond Elut Plexa is the best choice for a wide range of acid, neutral and basic analytes. Simple methods can be used that deliver cleaner extracts and higher recoveries from a wide range of analytes. Optimized polymeric design, in combination with a narrow particle size distribution, ensures consistent flow rates and reproducible, high analyte recoveries. The advanced polymeric design and particle surface modification minimize the common matrix interferences that are the major source of ion suppression, improving analytical sensitivity and data quality.

The Bond Elut Plexa is a high quality product with the same or better performance as the SampliQ OPT product, and should be the chosen material when seeking a next generation, polymeric SPE product.

Part Number	Description
12109601	Bond Elut Plexa cartridge 60 mg, 1 mL
12109603	Bond Elut Plexa cartridge 60 mg, 3 mL

For More Information

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