

Bond Elut Plexa™ PCX

EASY SPE WITH POLYMERIC CATION EXCHANGE TECHNOLOGY



Varian Bond Elut Plexa PCX is a further milestone in the development of simple and robust SPE methods. It uses a polymeric cation exchange (PCX) resin that combines the outstanding properties of Bond Elut Plexa – superior flow characteristics and improved analytical performance – with strong cation exchange functionalities.

This mixed-mode SPE sorbent removes neutral and acidic interferences from the matrix, concentrates basic analytes and therefore improves sensitivity in the determination of basic compounds.

Bond Elut Plexa PCX is ideal for applications in pharmacokinetics and pharmacodynamics, forensics and toxicology, foodstuffs and environmental investigations.

Key Benefits

- ▶ **Reduce method development time and cost.** Plexa PCX comes with a simple, single method approach for basic drugs that offers improved recoveries and cleaner extracts.
- ▶ **Improve productivity.** The narrow particle size distribution without fines allows faster flow rates, reducing the time required for sample preparation.
- ▶ **Outstanding reproducibility.** The uniformly sized, nearly mono-dispersed particles, result in homogeneous packing. Plexa PCX provides consistent results tube-to-tube and well-to-well.
- ▶ **Minimized ion suppression.** The highly polar, hydroxylated polymer surface is entirely amide-free and does not bind macromolecules. Strong binding of phospholipids and proteins is avoided, ensuring their efficient removal from plasma.



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Faster Flows with Plexa PCX

The enhanced flow features of Plexa PCX mean that sample throughput is increased with less dependency on high manifold vacuums. The absence of particle fines dramatically reduces frit blockage and sample loss. These features provide reproducible data, simple and rugged methods with time and cost saving benefits.

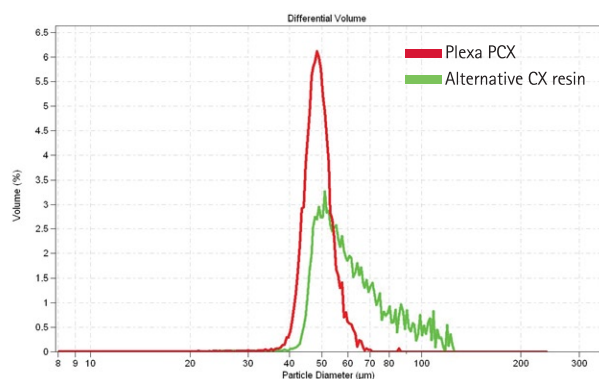


Figure 1. Comparison of particle size distribution between Plexa PCX and an alternative cation exchange (CX) resin using a particle size distribution analyzer.

The Plexa PCX mean flow rate (0.44 mL/min) is 83% faster than that of an alternative CX resin (0.24 mL/min). Data shown in Figure 2.

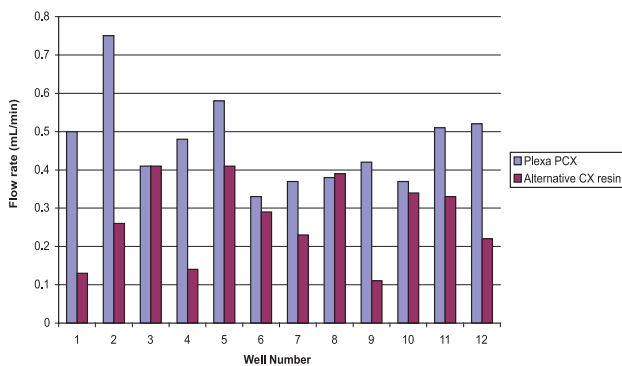


Figure 2. Comparison of flow rates between Plexa PCX and alternative CX resin. To compare flow rates, 12 wells were conditioned with 500 µL of methanol followed by 500 µL of water. Plasma, diluted to 1:3 with phosphoric acid, was then added to every well, and a constant vacuum of 5 in. Hg applied. The time was recorded to calculate flow rates.

Effective Removal of Phospholipids

Matrix-induced ion suppression leads to imprecision in bio-analytical LC/MS analysis. Therefore, a highly selective SPE procedure that removes phospholipids and proteins is essential for reliable and accurate analytical results. Plexa PCX reduces ion suppression more effectively than other mixed-mode SPE sorbents or simple protein precipitations. The highly polar, hydroxylated polymer exterior minimizes strong binding of proteins and phospholipids. Figure 3 demonstrates the results when analyzing human plasma. Plexa PCX is more effective at removing phospholipids when compared to a leading product from another manufacturer.

Phospholipids

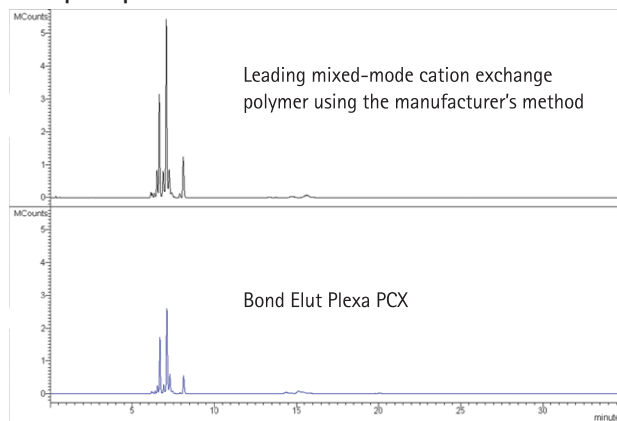


Figure 3. The superiority of Plexa PCX is clearly evident in removing matrix-induced ion suppressing compounds, as measured by phospholipids.

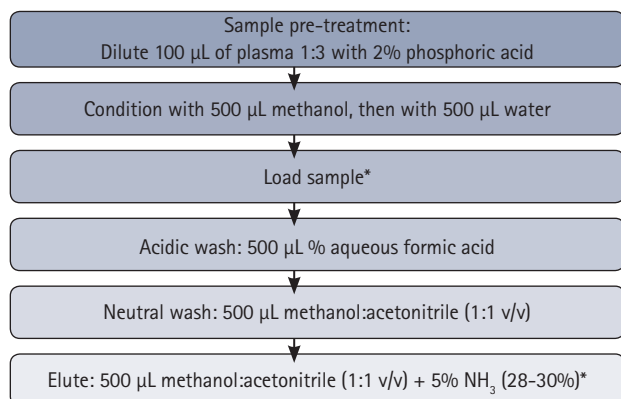
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A Single, Simple Method for Extracting Basic Drugs from Plasma

With Plexa PCX, method development time can be reduced or eliminated for the analysis of basic drugs from plasma. The following single method is effective for a wide variety of analytes.

Under acidic conditions, the charged analyte binds to the cation exchange groups of the sorbent. Polar interferences and proteins are washed away with an acidic, aqueous solution. A neutral wash with relatively strong solvents, such as 50:50 methanol:acetonitrile, is possible without loss of analyte (the wash elutes neutral compounds retained in the hydrophobic cores of the sorbent). Finally, a mixture of organic solvents with ammonia is used to disrupt the cation exchange interaction, resulting in the elution of the basic drugs.

Method developed on a Bond Elut Plexa PCX 96-well plate (10 mg):



*Do not exceed a flow rate of 1.0 mL/min during sample loading and elution. For all other steps, flow rates up to 5 mL/min are acceptable.

The table below shows analytes from human plasma, with excellent recoveries and reproducibility obtained by using the simple method.

Analyte	pK _a	logP	% Recovery ¹ (0.5 µg/mL)	% RSD ²	% Recovery ¹ (1 µg/mL)	% RSD ²
Sumatriptan	9.6	0.96	95	5	97	4
Atenolol	9.6	1.30	94	3	91	2
Albuterol	9.1	1.30	95	5	100	7
Lamotrigine	5.7	1.50	92	3	97	4
Ranitidine	8.2	1.90	101	5	94	6
Propranolol	9.5	3.60	97	7	92	4
Amitriptyline	9.4	4.60	95	5	91	5
Loratadine	4.9	5.20	100	4	91	4

Metoprolol (pK_a = 9.7) was added as internal standard prior to injection. ¹Recoveries calculated as % of signal intensity of an extracted sample compared to that of a calibration curve. ²RSD = standard deviation/ average recovery x 100; n = 6.

LC/MS Conditions: Column: Varian Pursuit™ C18 3 µm, 50 x 2.0 mm (Part Number A3051050X020). All samples were evaporated to dryness and reconstituted in 100 µL 0.1% aqueous formic acid: methanol (80: 20). Mobile phase: A, 0.1% formic acid; B, methanol. Gradient: t = 0 min 80% A: 20% B; t = 0 - 2 min ramp to 20% A: 80% B; t = 3.30 - 5 min 80% A: 0% B. Detection: Varian 320-MS LC/MS/MS; drying gas at 400 °C and 30 psi; nebulizing gas at 60 psi; capillary voltage at 50 V; polarity: positive.

Transition ions and collision energy were:

Analyte	Q1	Q2	CE[V]
Sumatriptan	296.1	201.0	-14.0
Atenolol	267.0	148.0	-23.5
Albuterol	240.1	145.0	-34.0
Lamotrigine	256.0	256.0	-5.0
Ranitidine	315.0	176.0	-21.0
Propranolol	260.1	116.0	-17.5
Amitriptyline	278.1	233.0	-17.0
Loratadine	383.1	337.0	-31.0

Bond Elut Plexa™ PCX

Ordering Information

Item Number	Description	Quantity
A4968010	Bond Elut 96 Plexa PCX, 10 mg	1 Plate
A4968030	Bond Elut 96 Plexa PCX, 30 mg	1 Plate
12108301	Bond Elut Plexa PCX, 30 mg, 1 mL	100 Tubes/Pk
12108601	Bond Elut Plexa PCX, 60 mg, 1 mL	100 Tubes/Pk
12108303	Bond Elut Plexa PCX, 30 mg, 3 mL	50 Tubes/Pk
12108603	Bond Elut Plexa PCX, 60 mg, 3 mL	50 Tubes/Pk
12108206	Bond Elut Plexa PCX, 200 mg, 6 mL	30 Tubes/Pk
12258506	Bond Elut Plexa PCX, 500 mg, 6 mL	30 Tubes/Pk
12221306	Bond Elut Plexa PCX Prospekt Cartridge	96/Pk
12281306	Bond Elut Plexa PCX 800 series Cartridge	96/Pk



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