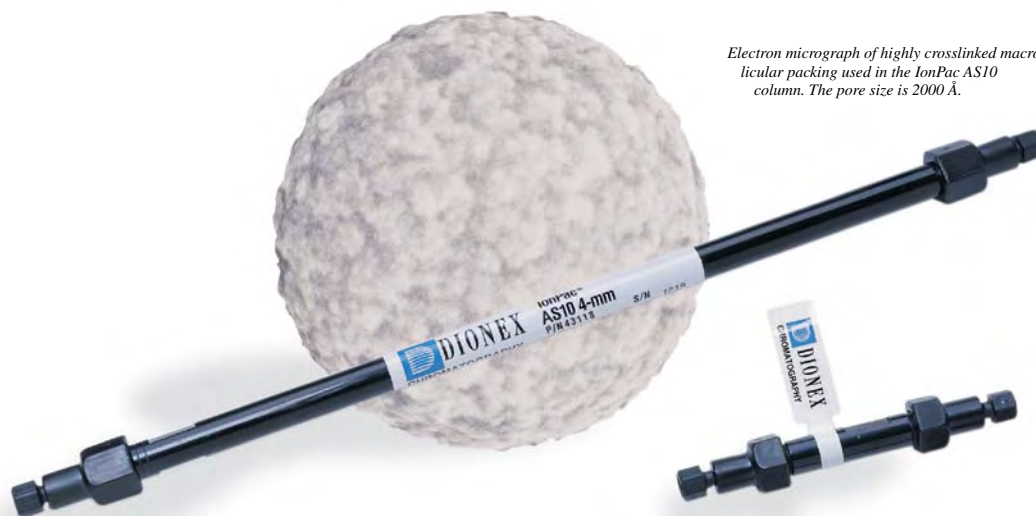


IonPac® AS10 Anion-Exchange Column and the IonPac AC10 Concentrator Column



Electron micrograph of highly crosslinked macroporous pellicular packing used in the IonPac AS10 column. The pore size is 2000 Å.

The IonPac AS10 column is a high-capacity anion-exchange column designed for the isocratic and gradient separation of inorganic anions and organic acids. The column provides excellent resolution of weakly retained low-molecular weight aliphatic acids. The high capacity of the AS10 stationary phase permits the analysis of trace-level analytes in high ionic-strength matrices. The column is particularly well-suited for the analysis of trace amounts of anions in nitric acid and nitrate salts, because the IonPac AS10 resin strongly retains nitrate. The IonPac AC10 concentrator column is optimized for use with the IonPac AS10 and is ideal for preconcentration and matrix elimination strategies for reliable trace-level analysis.

Superior Chromatographic Performance

- Isocratic and gradient separation of organic and inorganic anions with hydroxide eluents
- Exceptional resolution of low-molecular weight aliphatic acids
- Superior retention of nitrate for trace-anion analysis in nitric acid and nitrate salts
- High-capacity anion-exchange matrix for trace-level analysis of anions in high ionic-strength matrices; 170 µeq per column (4 x 250 mm)
- Full solvent compatibility permits the use of HPLC solvents to modify column selectivity, control analyte solubility, and facilitate column clean-up
- Optimized IonPac AC10 concentrator complements the IonPac AS10 and provides reliable matrix elimination and sample preconcentration

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High-Efficiency Particle Structure

The IonPac AS10 column matrix is composed of a highly crosslinked macroporous core with an anion-exchange latex bonded to the surface (Figure 1). The core is an 8.5- μm diameter bead with a pore size of 2000 Å, and consists of ethylvinylbenzene crosslinked with 55% divinylbenzene. The surface anion-exchange layer consists of 65-nm MicroBead™ latex particles bonded to the substrate. The small particle size of the latex layer results in excellent mass transfer characteristics for efficient chromatography. The latex particles are functionalized with quaternary ammonium groups.

Solvent-Compatible Packing

The high degree of crosslinking renders the IonPac AS10 column compatible with up to 100% of HPLC solvents, for example, acetonitrile. Organic solvents can be used to alter column selectivity, enhance sample solubility, and allow efficient column clean-up. This can eliminate time-consuming sample preparation steps and extend the utility of the column to new applications.

The IonPac AC10 Concentrator Column

The IonPac AC10 concentrator column is designed for use with the IonPac AS10 column. The AC10 is packed with 13- μm diameter microporous resin beads consisting of a solvent-compatible ethylvinylbenzene/divinylbenzene copolymer. This is agglomerated with 160-nm diameter latex beads derivatized with the same functional groups as the IonPac AS10 column. The IonPac AC10 concentrator column is used for matrix elimination as well as for sample preconcentration.

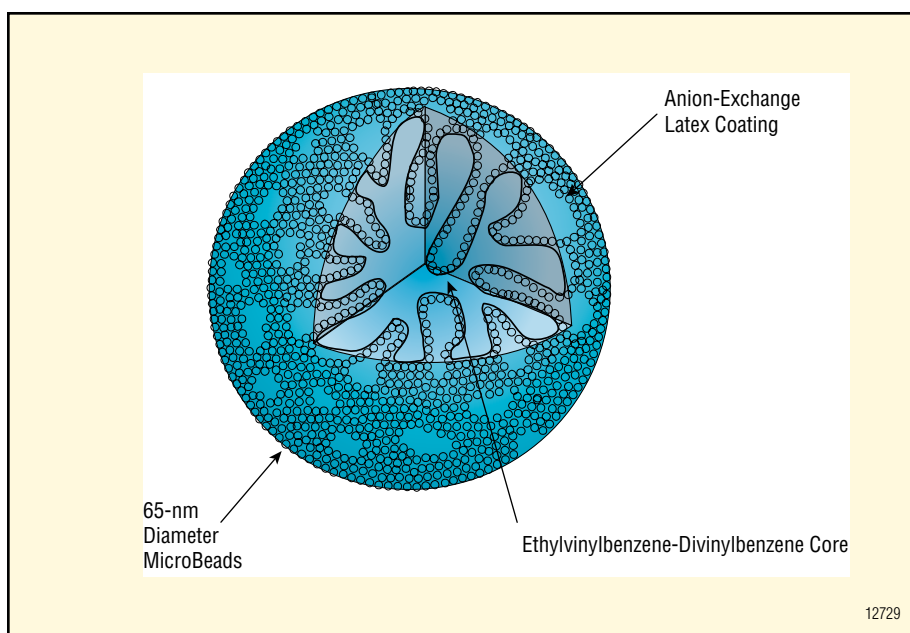


Figure 1. Structure of the highly cross-linked macroporous pellicular packing used in the AS10 column.

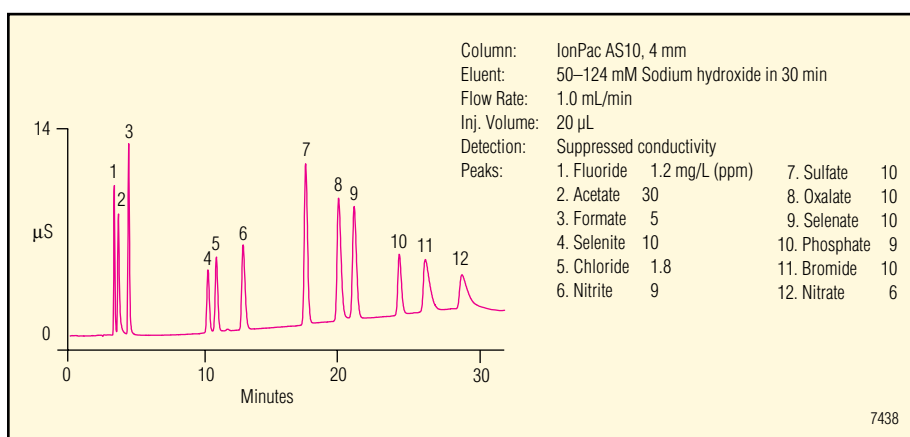


Figure 2. The common organic and inorganic anions are separated on the IonPac AS10 using a hydroxide gradient.

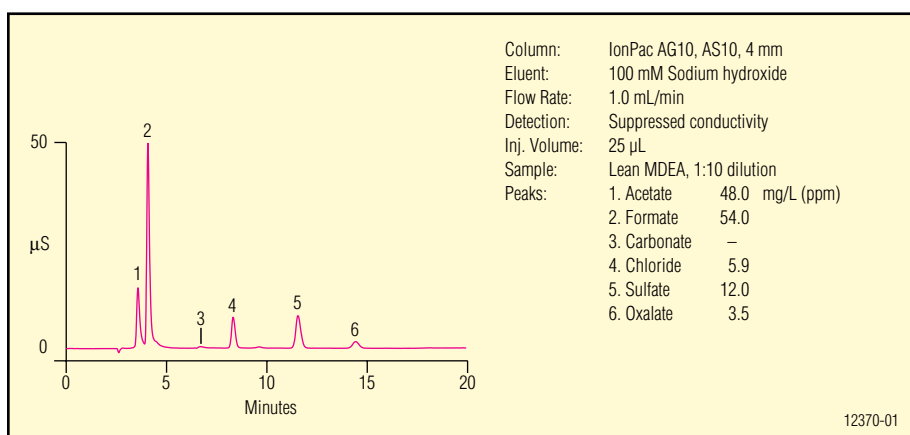


Figure 3. An isocratic hydroxide eluent is used to analyze corrosive anions in lean methyldiethanolamine (MDEA) from natural gas scrubber solutions.

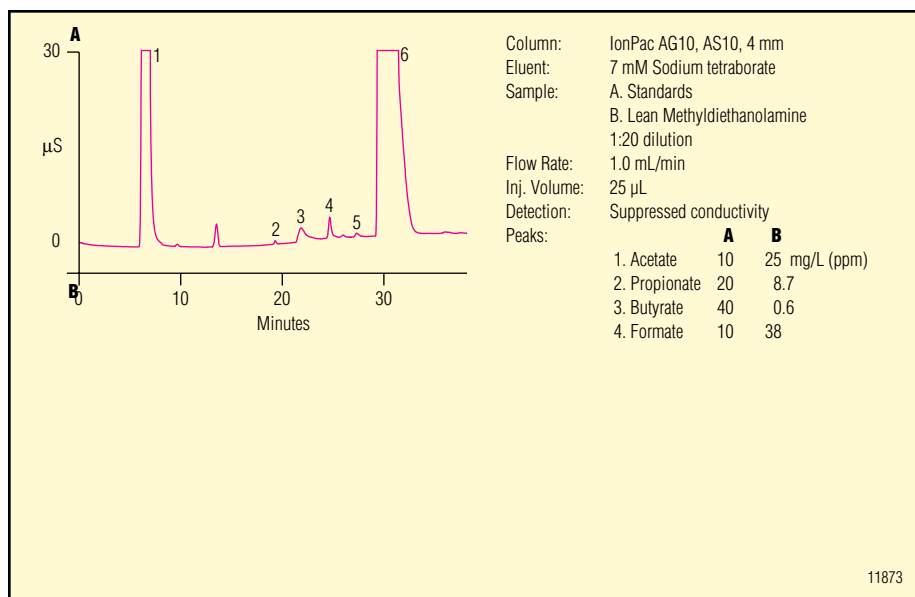


Figure 4. The IonPac AS10 provides excellent resolution of weakly retained aliphatic acid anions, particularly when used with a weak sodium tetraborate eluent (A). These conditions are used for the analysis of aliphatic acids in lean MDEA (B).

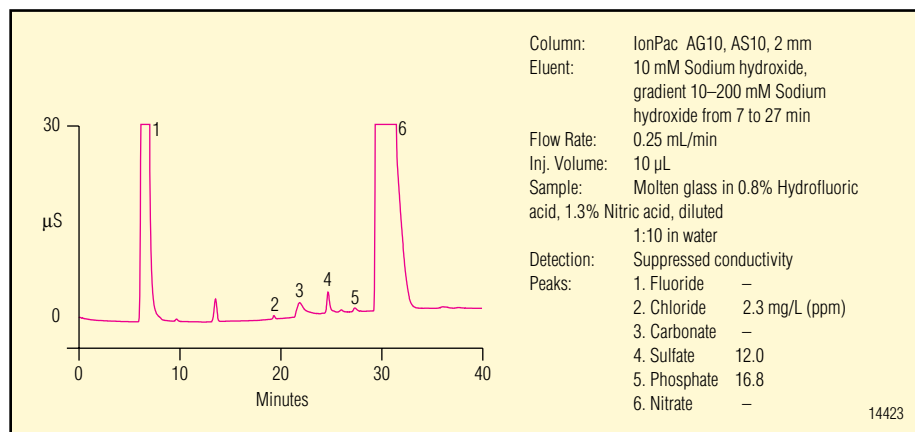


Figure 5. Nitrate is strongly retained by the IonPac AS10 resin, making this column a good choice for the analysis of trace anions in a nitrate or nitric acid matrix. In this example a sodium hydroxide gradient is used to analyze inorganic anions from molten glass in a matrix of hydrofluoric and nitric acid.

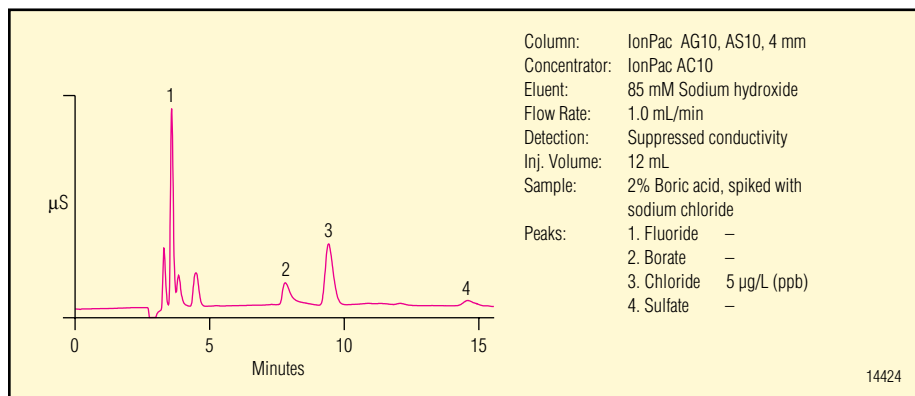


Figure 6. The high capacity of the IonPac AS10 facilitates the analysis of trace anions in this 2% boric acid primary cooling water sample. In this example 12 mL of the sample was preconcentrated on the IonPac AC10 concentrator column.

Inorganic Anions and Organic Acids

The IonPac AS10 provides excellent resolution of many common inorganic anions and organic acids using a simple hydroxide gradient (Figure 2). Isocratic conditions frequently are sufficient to resolve the analytes of interest. The example in Figure 3 is a separation of the corrosive anions and organic acids found in natural gas scrubber solutions. This application is widely used in the chemical and petrochemical industries.

Aliphatic Acids

The high anion-exchange capacity of the column makes it an excellent choice for the resolution of weakly retained species. Aliphatic acids are particularly well-resolved with a weak tetraborate eluent (Figure 4).

Trace Anions in Nitrate Matrices

The IonPac AS10 strongly retains nitrate. This, together with its high capacity, makes it ideal for the analysis of trace anions in nitric acid and nitrate salts (Figure 5).

Trace-Anion Analysis with Preconcentration

The high capacity of the IonPac AS10 column makes it a good choice for the analysis of trace anions in high ionic-strength matrices. Figure 6 shows an isocratic analysis of the anions in a 2% boric acid sample taken from a power plant primary cooling water sample. Low detection limits in this example were achieved by concentrating 12 mL of sample on the IonPac AC10 concentrator column prior to analysis.

Ordering Information

In the U.S., call 1-800-346-0390, or contact the Dionex Regional Office nearest you. Outside the U.S., order through your local Dionex office or distributor. Refer to the following part numbers.

4-mm Columns

IonPac AS10 Analytical Column
(4 x 250 mm) P/N 43118
IonPac AG10 Guard Column
(4 x 50 mm) P/N 43119
IonPac AC10 Trace Concentrator
Column (4 x 50 mm) P/N 43133

2-mm Columns

IonPac AS10 Analytical Column
(2 x 250 mm) P/N 43123
IonPac AG10 Guard Column
(2 x 50 mm) P/N 43124
IonPac AC10 Trace Concentrator
Column (2 x 50 mm) P/N 43134

SPECIFICATIONS

Columns

IonPac AS10 Analytical Column

Dimensions:

2 x 250 mm
4 x 250 mm

*IonPac AG10 Guard Column and AC10
Concentrator Column Dimensions:*

2 x 50 mm
4 x 50 mm

Maximum Operating Pressure:

28 MPa (4000 psi)

Chemical Compatibility:

pH 0–14
0–100% of typical HPLC solvents

Column Construction:

PEEK with internal style 10–32
threaded ferrule-style end fittings.
All components are nonmetallic.

IonPac AS10, AG10 Resin Composition

Bead Diameter: 8.5 μm
Crosslinking (% Divinylbenzene): 55%

IonPac AS10, AG10 MicroBead Latex

Latex Diameter: 65 nm
Latex Crosslinking: 5%
Anion-Exchange Capacity:
42.5 μeq (2 x 250 mm)
170 μeq (4 x 250 mm)
Functional Group:
Alkanol quaternary ammonium

IonPac AC10 Resin Composition

Bead Diameter: 13 μm
Crosslinking (% Divinylbenzene): 55%

IonPac AC10 MicroBead Latex

Latex Diameter: 160 nm
Latex Crosslinking: 5%
Anion-Exchange Capacity:
0.8 μeq (2 x 50 mm)
4 μeq (4 x 50 mm)
Functional Group:
Alkanol quaternary ammonium

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