

IonPac® AS12A Anion-Exchange Column



The IonPac AS12A is a carbonate-selective anion-exchange column designed for the fast separation of inorganic anions, including fluoride, chlorite, bromate, chloride, nitrite, bromide, chlorate, nitrate, phosphate, and sulfate. Separation of these anions can be achieved in less than 12 minutes using an isocratic carbonate/bicarbonate eluent. The IonPac AS12A column offers excellent retention of fluoride out of the water dip and resolution of carbonate from chloride and bromate. Solvent compatibility permits easy column clean-up after the analysis of complex matrices.

Now sold under the
Thermo Scientific brand

Thermo
SCIENTIFIC

Superior Chromatographic Performance

- Fast, isocratic separation of inorganic anions and oxyhalides including chlorite, bromate, and chlorate in 12 minutes.
- Superior retention and quantification of fluoride.
- Ideal for trace analysis of chloride and sulfate in high-carbonate samples.
- Meets or exceeds performance requirements of U.S. EPA Methods 300.0 (A) and (B).
- Compatible with organic solvents to enhance analyte solubility, modify column selectivity, or for effective column cleanup.

- Direct transfer of 4-mm applications to the 2-mm column format for more economical operation, three- to fourfold reduction in eluent consumption, and fourfold increase in mass sensitivity.

Determination of Inorganic Anions in Diverse Sample Matrices

- Source water and drinking water
- Municipal and industrial wastewater
- Industrial cooling water
- Semiconductor devices
- Hazardous waste extracts and dump site leachates
- Acid rain
- Carbonated beverages
- Caustic samples
- Electronic grade reagents



High-Efficiency Particle Structure

The IonPac AS12A packing is a unique structure composed of a highly crosslinked core and a MicroBead™ anion-exchange layer attached to the surface, as shown in Figure 1. The substrate for the IonPac AS12A column is a 9- μm diameter macroporous resin bead consisting of ethylvinylbenzene crosslinked with 55% divinylbenzene.

The anion-exchange layer is functionalized with quaternary ammonium groups. The latex-bead anion-exchange layer has a controlled thickness, which results in excellent mass-transfer characteristics and consequently, highly efficient peaks.

Isocratic Separation of Inorganic Anions and Oxyhalides

The IonPac AS12A has been optimized for the fast, isocratic separation of inorganic anions and oxyhalides. Figure 2 illustrates the isocratic separation of the common inorganic anions and oxyhalides in less than 12 minutes using a carbonate/bicarbonate eluent coupled with suppressed conductivity detection.

Versatile Operation

The IonPac AS12A can be operated for fast analysis of inorganic anions using a 10.5 mM carbonate/0.5 mM bicarbonate eluent as illustrated in Figure 3. Figure 4 illustrates the flexibility of the AS12A with a borate gradient for the resolution of fluoride, acetate, formate, and chlorite along with the common inorganic anions and oxyhalides.

Determination of Inorganic Anions and Low Molecular Weight Organic Acids

Low molecular weight organic acid and monovalent and polyvalent inorganic anions encountered in the chemical and power industries can be determined in a single run on the IonPac AS12A. Figure 4 illustrates an optimized separation of weakly retained anions, including fluoride, acetate, formate, and chlorite, using a borate linear gradient.

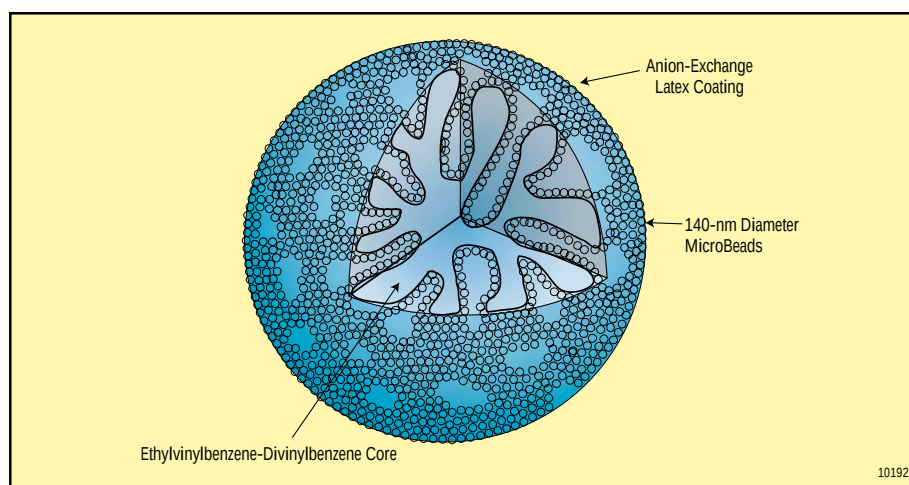


Figure 1. Macroporous resin with anion-exchange functionalized latex layer.

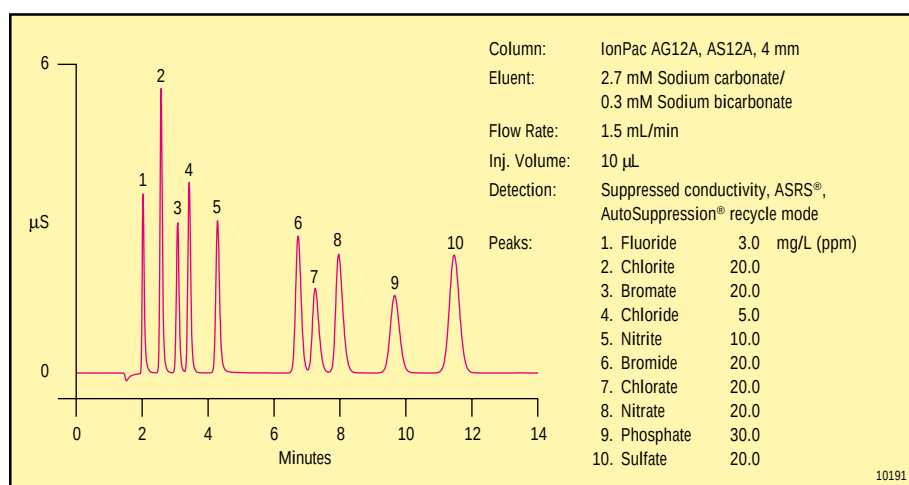


Figure 2. Isocratic separation of inorganic anions and oxyhalides on the IonPac AS12A column.

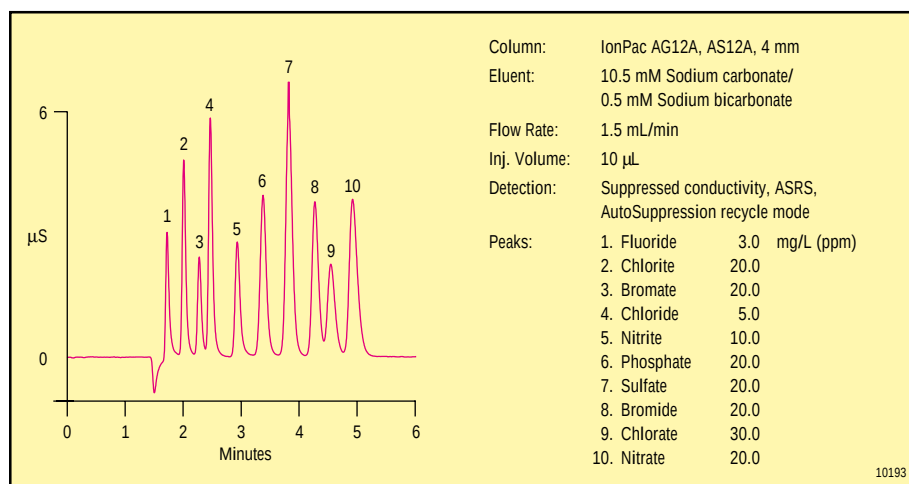


Figure 3. High-efficiency IonPac AS12A packing permits fast anion analysis.

IonPac AS12A for Anionic Contaminants on Semiconductor Devices

The anionic contamination present on the surface of magnetic recording heads, also known as sliders, used in hard disk drives is a major determinant for whether the thin-film metallurgy will corrode during processing or subsequent use. Due to the small surface area of the samples, previous Ion Chromatography (IC) methods required measuring several sliders at a time and taking an average value. A new technique has been developed using microextraction followed by microbore IC to measure anionic contamination on a single slider. The slider is placed in an PEEK extraction cell body (1/4-28 x 1/16 in. i.d. inlet fitting and 10-32 ferrule style outlet fitting) and extracted with 2.4 mL DI water at 0.8 mL/min. for 3 minutes and then concentrated on an AMC-1 MicroConcentrator column. The AS12A column is used to separate the anionic contaminants on the surface of a single film slider. Figure 5 illustrates the separation of anionic contaminants using a carbonate/bicarbonate eluent on a 2-mm IonPac AS12A column.

IonPac AS12A for Inorganic Anions in Caustic Samples

Anionic impurities in caustic soda (sodium hydroxide) and caustic potash (potassium hydroxide) are monitored by manufacturers and users for quality control of these products. Figure 6 illustrates the separation of anionic contaminants in 50% caustic soda. Using an isocratic carbonate/bicarbonate eluent on the IonPac AS12A column, chloride, chlorate, and sulfate can be determined in less than 12 minutes.

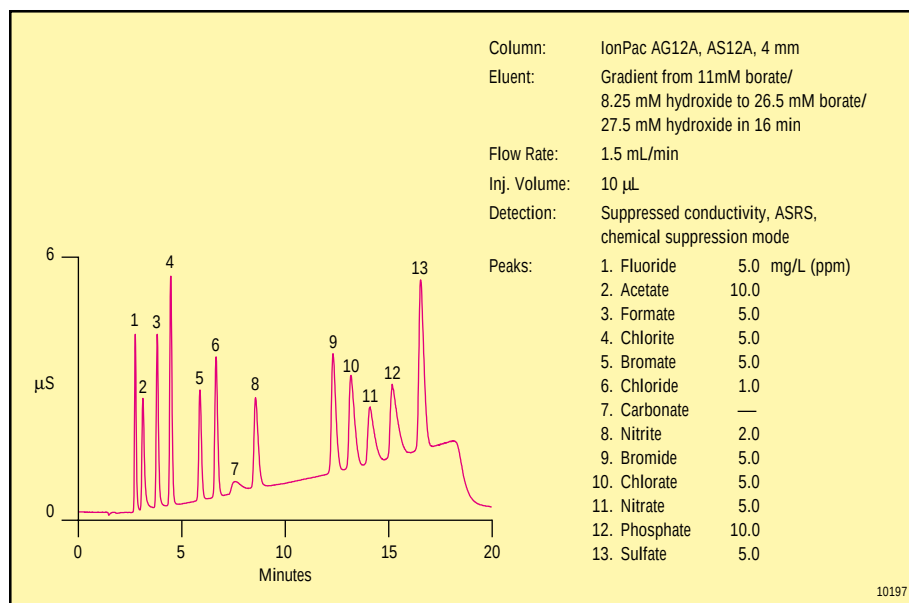


Figure 4. Borate gradient separation of anions using the IonPac AS12A column.

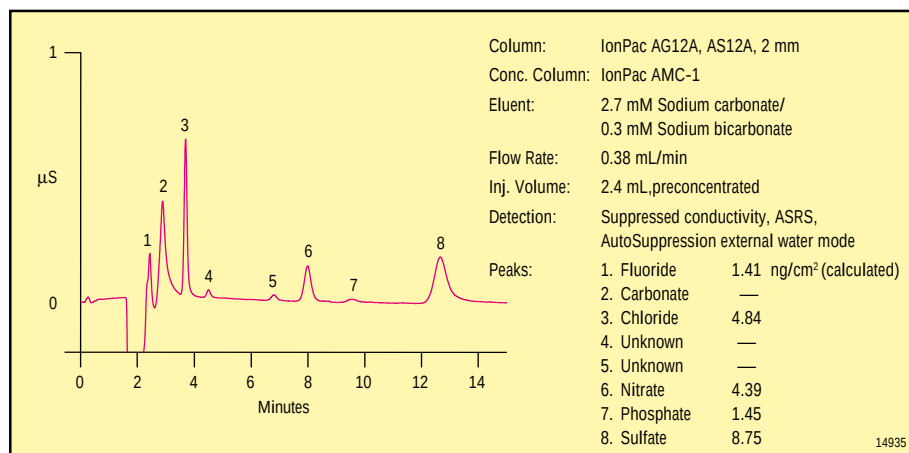


Figure 5. Determination of anionic contaminants on thin-film sliders used in hard disk drives.

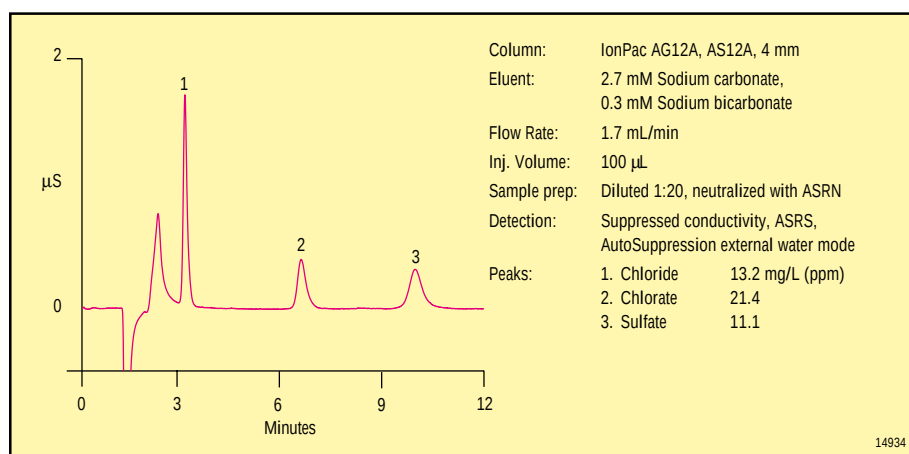


Figure 6. Determination of anionic impurities in caustic soda using the IonPac AS12A column. The 50% caustic soda sample is diluted 1:20, then neutralized using an ASRN™ AutoNeutralizer.

Rugged and Reliable Column Technology

The highly crosslinked core of the IonPac AS12A packing permits the use of HPLC solvents to alter column selectivity, control analyte solubility, facilitate column cleanup, and, more importantly, allows for the determination of inorganic anions in complex matrices. Figure 7 illustrates the separation of trace-level anions in electronics-grade solvent using the IonPac AS12A column.

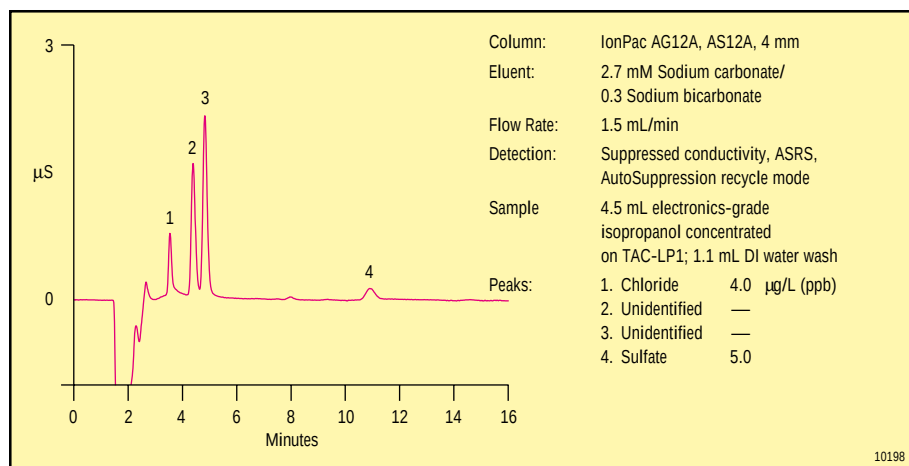


Figure 7 Determination of anions in electronic-grade solvent using the IonPac AS12A column.

SPECIFICATIONS	
Dimensions:	Analytical Column Latex Characteristics:
IonPac AS12A Analytical Column:	Functional Group:
2 x 200 mm and 4 x 200 mm	Alkyl quaternary ammonium ion
IonPac AG12A Guard Column:	Latex Crosslinking: 0.2%
2 x 50 mm and 4 x 50 mm	Latex Diameter: 140 nm
Maximum Operating Pressure:	Hydrophobicity: Medium hydrophobic
4000 psi	Capacity*:
Mobile Phase Compatibility:	13 μeq (2 x 200 mm analytical column)
pH 0–14; 0–100% HPLC solvents	1 μeq (2 x 50 mm guard column)
Analytical Column Substrate Characteristics:	52 μeq (4 x 200 mm analytical column)
Bead Diameter: 9.0 μm	4 μeq (4 x 50 mm guard column)
Pore Size: 2000Å	Column Construction:
Crosslinking (%DVB): 55%	PEEK with 10-32 threaded, ferrule-style end fittings. All components are non- metallic.

* The IonPac AG12A guard columns are packed with a microporous, pellicular resin and are optimized for concentration work. The guard latex is designed for trace-anion concentrator methods.

Ordering Information

For optimum ease-of-use and economy, the IonPac AS12A column should be used with the ASRS® Anion Self-Regenerating Suppressor. For added ease-of-use, Dionex offers a 0.5 M Carbonate Eluent Concentrate and a 0.5 M Bicarbonate Eluent Concentrate and a line of anion standards to make your chromatography analysis even easier. Please refer to the part numbers listed or refer to the Dionex Product Selection Guide for more details.

When performing gradient anion-exchange applications on the AS12A, an Anion Trap Column (ATC) should be installed between the gradient pump and the injection valve to remove anionic contaminants from the eluent.

For 4-mm concentrator work, use the IonPac AG12A guard column, TAC Anion Concentrator Column, or AMC-1 Anion MicroConcentrator when a single piston pump such as the DQP or DXP pump is used for sample delivery. Use the TAC-LP1 Anion Concentrator Column when the sample is delivered with a syringe or with a low pressure autosampler such as the AS40 or AS50. For 2-mm concentrator work, use the IonPac AG12A guard column or the AMC-1 Anion MicroConcentrator when a single piston pump such as the DQP or DXP pump is used for sample delivery.

To order in the U.S., call (800) 346-6390, 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.

IonPac AS12A Analytical Column
(4 x 200 mm) P/N 046034

IonPac AG12A Guard Column
(4 x 50 mm) P/N 046035

IonPac AS12A Analytical Column
(2 x 200 mm) P/N 046055

IonPac AG12A Guard Column
(2 x 50 mm) P/N 046056

0.5 M Carbonate Anion Eluent
Concentrate (500 mL; for use with...
AS12A column) P/N 037162

0.5 M Bicarbonate Anion Eluent
Concentrate (500 mL; for use
with AS12A column) P/N 037163

ATC-1 Anion Trap Column
(for use with 4-mm columns)
..... P/N 037151

ATC (2-mm) Anion Trap Column
(for use with 2-mm columns)
..... P/N 043131

TAC-2 Trace Anion Concentrator
(3 x 35 mm)..... P/N 043101

TAC-LP1 Trace Anion Concentrator
(4 x 35 mm) P/N 046026

AMC-1 Anion MicroConcentrator
(2 x 15 mm) P/N 051760



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