

IonPac® AS17 Anion-Exchange Column



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The IonPac AS17 is a hydroxide-selective anion exchange column designed for the fast gradient separation of anions including fluoride, acetate, chloride, nitrite, bromide, nitrate, sulfate, and phosphate. Separation of these anions can be achieved in less than 10 minutes using a hydroxide gradient delivered with an EG40 Eluent Generator. The AS17 column is recommended for use with the EG40 Eluent Generator, which automatically produces potassium hydroxide eluents from water, making gradient separations as easy as isocratic runs.

Using an EG40 hydroxide gradient, the common inorganic anions can be separated in a variety of sample matrices including drinking water, wastewater, process streams, and scrubber solutions. The AS17 selectivity provides excellent retention of fluoride from the water dip and baseline resolution of fluoride, acetate, propionate, and formate. Solvent compatibility permits easy column clean-up after the analysis of complex matrices.

Superior Chromatographic Performance

- Fast gradient separation of inorganic anions in 10 minutes.
- Superior retention and quantification of fluoride, acetate, propionate, and formate.
- Meets performance requirements specified in U.S. EPA Method 300.0 (A).
- Hydroxide selective alternative for IonPac AS4A, AS4A-SC, and AS14 applications.
- Compatible with the EG40 Eluent Generator.
- Hydroxide eluent suppresses to a very low background for trace level determinations and easy fluoride analysis.
- Operate at ambient or elevated temperatures. Column selectivity is optimized for a 30 °C operating temperature to ensure reproducible results.

- Compatible with organic solvents to enhance analyte solubility, modify column selectivity, or for effective column clean-up.
- Direct transfer of 4-mm applications to the 2-mm column format for more economical operation, three- to four-fold reduction in eluent consumption, and a four-fold increase in mass sensitivity.

Recommended for Inorganic Anion Analysis in Diverse Sample Matrices

- Source water and drinking water
- Municipal and industrial wastewater
- Industrial cooling water
- Hazardous waste extracts and dump site leachates
- Acid rain
- Foods and beverages
- Anionic counterions in pharmaceuticals and synthetic peptides
- Polymers such as polyols and polysulfonates
- Scrubber solutions



High Efficiency Particle Structure

The IonPac AS17 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 AS17 column is a 10.5- μm diameter microporous resin bead, consisting of ethylvinylbenzene crosslinked with 55% divinylbenzene.

The anion exchange layer is functionalized with very hydrophilic 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.

Gradient Separations as Simple as Isocratic Runs with the EG40 Eluent Generator

The EG40 Eluent Generator electrolytically produces high purity potassium hydroxide eluent from water, eliminating the need for eluent preparation. The potassium hydroxide eluent is free of carbonate contamination. Carbonate-free hydroxide eluents minimize baseline shifts during hydroxide gradients which

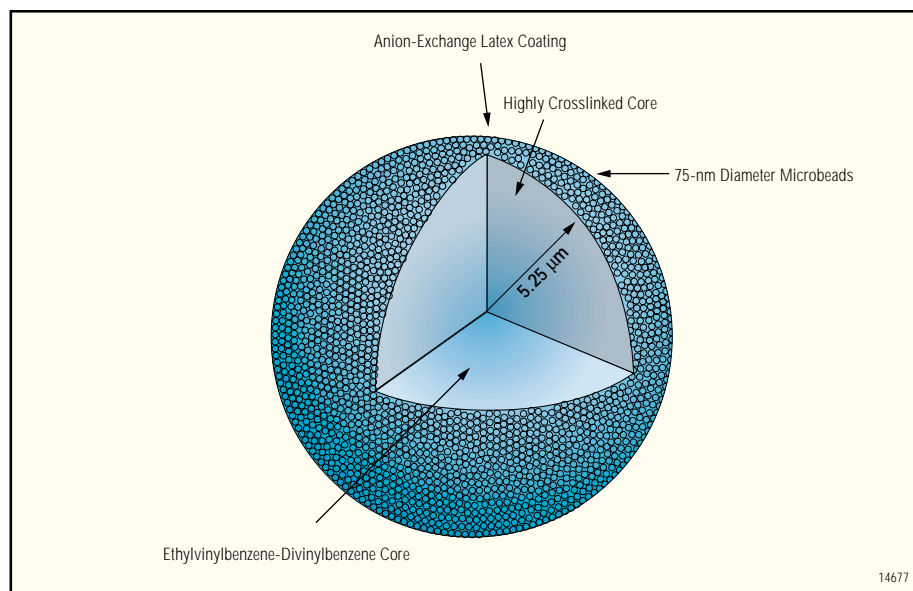


Figure 1. Microporous resin with anion-exchange functionalized latex layer.

provides greater retention time reproducibility, lower background conductivity, and lower detection limits for target analytes. *Figure 2* illustrates the gradient separation of common anions using a potassium hydroxide gradient delivered with the EG40. Common inorganic anions can be determined in less than 10 minutes, injection to injection.

Inorganic Anions in Drinking Water, Wastewater, and Soil Extracts

The IonPac AS17 is an ideal column for analyzing drinking water, wastewater, and soil extracts. The AS17 meets the performance requirements of U.S. EPA Method 300.0 (A). However, the use of hydroxide as an eluent is considered a method modification. Fluoride is well resolved from the system void and can be determined at very low concentrations. Low levels of inorganic anions can easily be determined in drinking water and bottled water samples as illustrated in *Figure 2*. Carbonate is well resolved from chloride and sulfate and does not interfere with quantification of these analytes. In an aqueous soil extract, low levels of inorganic anions can easily be determined in less than 10 minutes using a potassium hydroxide gradient as illustrated in *Figure 3*.

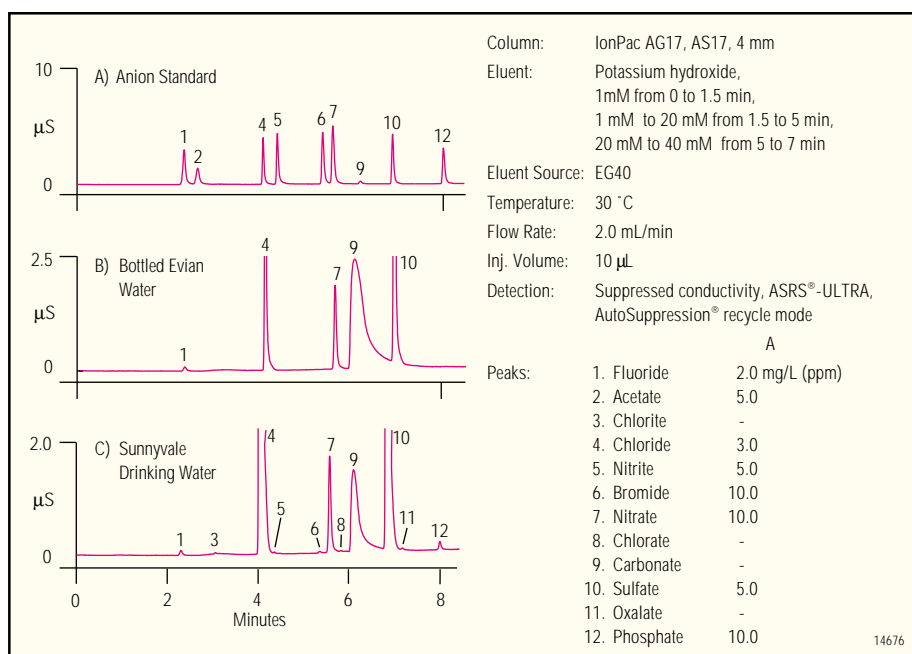


Figure 2. Determination of inorganic anions in drinking water samples on an IonPac AS17 column using a potassium hydroxide gradient delivered by an EG40 Eluent Generator.

Expanded Anion Analysis using Gradient Elution with the EG40 Eluent Generator

The AS17 column provides excellent separation of a variety of anions including inorganic anions, oxyhalides, and organic acids, using a hydroxide gradient. Weakly retained organic acids such as acetate, propionate, and formate are resolved using an isocratic hydroxide eluent and the inorganic anions and a oxyhalides are separated with a hydroxide gradient, as illustrated in *Figure 4*. Using a potassium hydroxide gradient, these anions can be separated in less than 20 minutes.

Extended Application Capabilities

The unique selectivity of the AS17 column makes it an ideal column for methods development of specialized anion applications. Sulfur species such as sulfite, sulfate, and thiosulfate can be determined in a chemical industrial wastewater sample. With an optimized potassium hydroxide gradient, these analytes can easily be determined in less than 10 minutes as illustrated in *Figure 5*.

The IonPac AS17 column is also ideal for the determination of anionic additives in personal care products. The AS17 column provides excellent separation of monofluorophosphate, phosphate, and sulfate found in dental care products in less than 20 minutes using a simple potassium hydroxide gradient as illustrated in *Figure 6*.

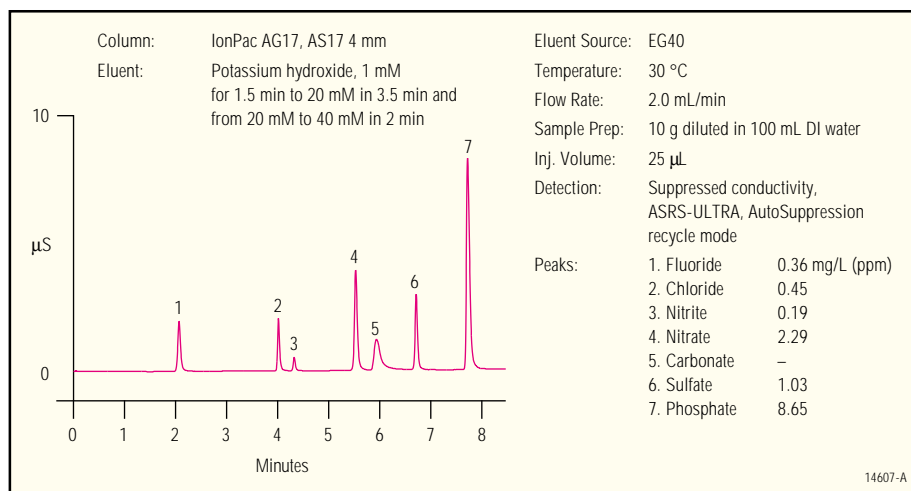


Figure 3. Determination of inorganic anions in an aqueous soil extract on an IonPac AS17 column using a potassium hydroxide gradient delivered by an EG40 Eluent Generator.

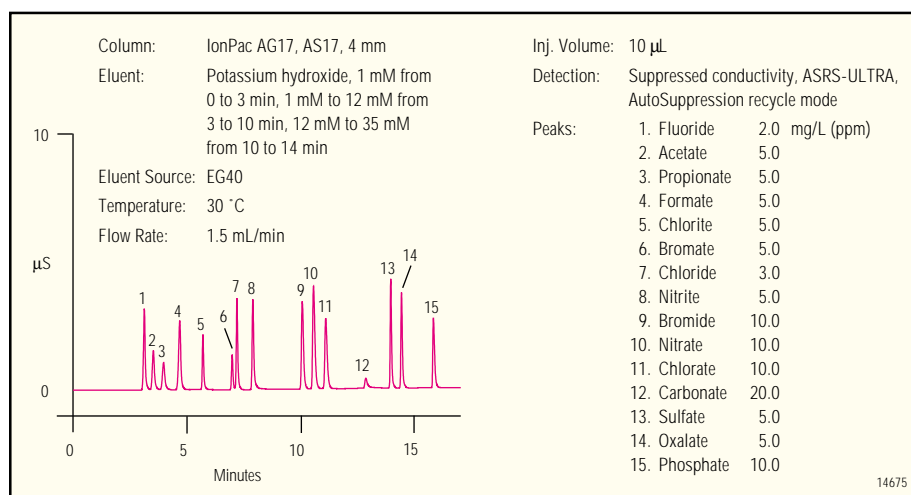


Figure 4. Expanded anion separation on an IonPac AS17 column using a potassium hydroxide gradient delivered by an EG40 Eluent Generator.

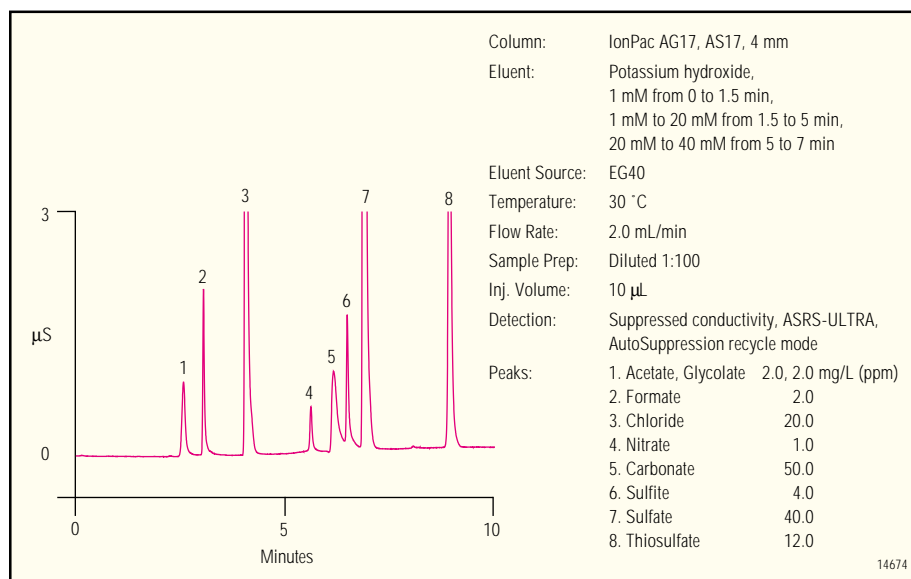


Figure 5. Determination of sulfur species in a simulated industrial wastewater sample. Analysis was performed on an IonPac AS17 column using a potassium hydroxide gradient delivered by an EG40 Eluent Generator.

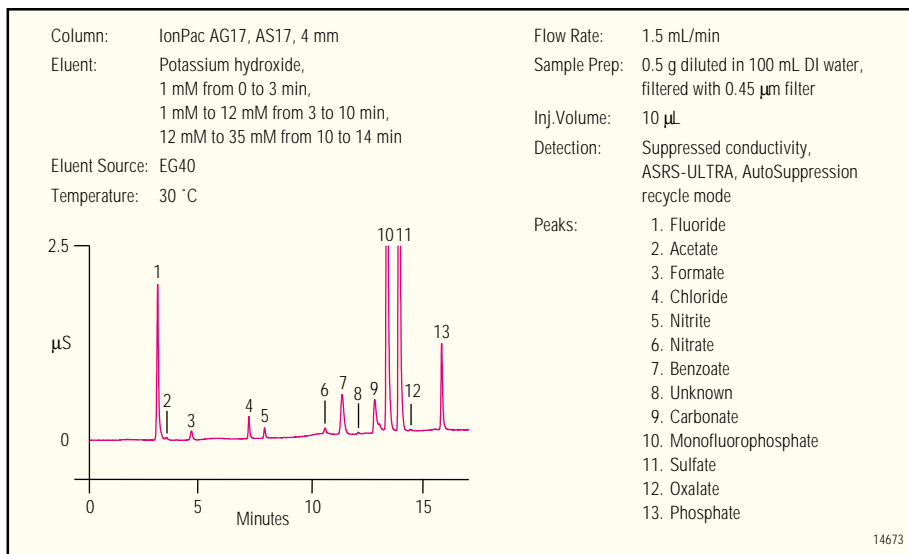


Figure 6. Determination of anionic additives in toothpaste on an IonPac AS17 column using a potassium hydroxide gradient delivered by an EG40 Eluent Generator.

Ordering Information

For optimum ease-of-use and economy, the IonPac AS17 column should be used with the ASRS® Anion Self-Regenerating Suppressor. It is recommended to operate the IonPac AS17 column at an elevated temperature (30 °C) for optimal retention time reproducibility.

When performing sodium or potassium hydroxide gradient anion exchange applications on the AS17, an Anion Trap Column, the ATC, should be installed between the gradient pump and the injection valve to remove anionic contaminants from the eluent. The EG40 Eluent Generator is used to automatically produce potassium hydroxide gradients from water. When using the EG40 Eluent Generator for eluent delivery, a second ATC column should be installed between the EG40 degas module and the injector.

For 4-mm concentrator work, use the IonPac AG17 guard column or TAC Anion Concentrator Column 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 an autosampler such as the AS40. For 2-mm concentrator work, use the IonPac AG17 guard column when a single piston pump such as the DQP or DXP pump is used for sample delivery.

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 AS17 Analytical Column (4 x 250 mm).....P/N 055682
- IonPac AG17 Guard Column (4 x 50 mm).....P/N 055684
- IonPac AS17 Analytical Column (2 x 250 mm).....P/N 055683
- IonPac AG17 Guard Column (2 x 50 mm).....P/N 055685

- ATC-1 Anion Trap Column (use with 4-mm columns) P/N 037151
- ATC (2-mm) Anion Trap Column (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

SPECIFICATIONS

Dimensions:
 IonPac AS17 Analytical Column: 2 x 250 mm and 4 x 250 mm
 IonPac AG17 Guard Column: 2 x 50 mm and 4 x 50 mm

Maximum Operating Pressure:
 4000 psi

Mobile Phase Compatibility:
 pH 0–14; 0–100% HPLC solvents

Substrate Characteristics:
 Bead diameter (µm): 10.5 µm
 Crosslinking (%DVB): 55%

Latex Characteristics:
 Functional Group: Alkanol quaternary ammonium ion
 Latex Crosslinking: 6%
 Latex Diameter: 75 nm
 Hydrophobicity: Low Hydrophobic

Capacity:
 7.5 µeq (2 x 250 mm analytical column)
 1.5 µeq (2 x 50 mm guard column)
 30 µeq (4 x 250 mm analytical column)
 6 µeq (4 x 50 mm guard column)

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



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