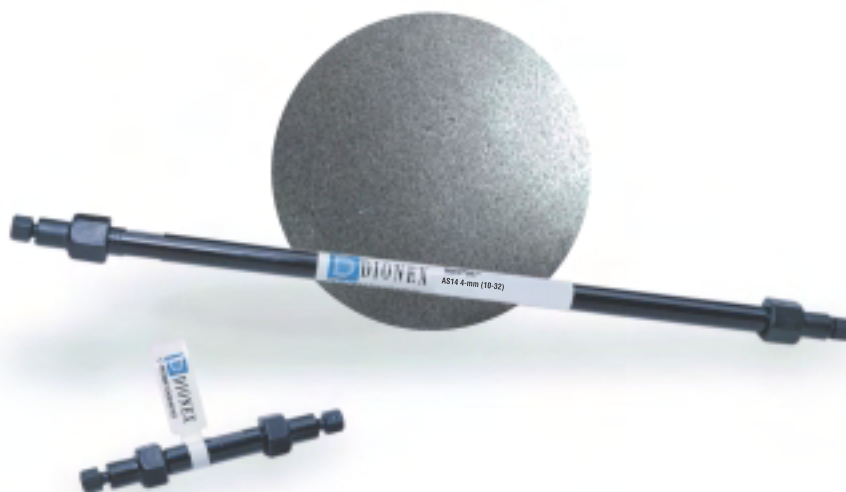


## IonPac® AS14 Anion-Exchange Column



The IonPac AS14 anion-exchange column is designed for the fast analysis of inorganic anions, including fluoride, acetate, chloride, nitrite, bromide, nitrate, phosphate, and sulfate. The IonPac AS14 is suited for applications performed using the IonPac AS4A-SC and AS12A with the advantages of improved peak resolution and retention of fluoride. Solvent compatibility permits easy column clean-up after the analysis of complex matrices. The AS14A column can also be used for the fast, isocratic separation of the common inorganic anions. Refer to the AS14A Product Information Bulletin for more information.

Now sold under the  
Thermo Scientific brand

**Thermo**  
SCIENTIFIC

#### Determination of Inorganic Anions in Diverse Sample Matrices

- Source water and drinking water
- Municipal and industrial wastewater
- Industrial cooling water
- Power plant waters
- Hazardous waste extracts and dump site leachates
- Acid rain
- Inorganic anions in foods and beverages
- Anionic counterions in pharmaceutical preparations and synthetic peptides
- Polymers such as polyols and polysulfonates
- Kraft liquors

#### Superior Chromatographic Performance

- Universal column for inorganic anions. Designed to be used in IonPac AS4A, AS4A-SC, and

AS12A applications with equivalent linearity and precision.

- Fast isocratic separation of fluoride, chloride, nitrite, bromide, nitrate, phosphate, and sulfate using a simple carbonate/bicarbonate eluent. Retains fluoride out of the water dip, free of interference from organic acids, with elution of sulfate in 13 min.
- Meets or exceeds requirements of U.S. EPA Method 300.0(A).
- Superior retention and quantification of fluoride, glycolate, acetate, and formate.
- Sodium tetraborate gradient optimizes difficult separations.
- Solvent compatible. Solvent samples for determining contaminating anions. Use organic solvents to enhance analyte solubility, modify column selectivity, or for effective column clean-up.
- Available in 4-mm or 2-mm formats. Use the 2-mm microbore column for economical operation.



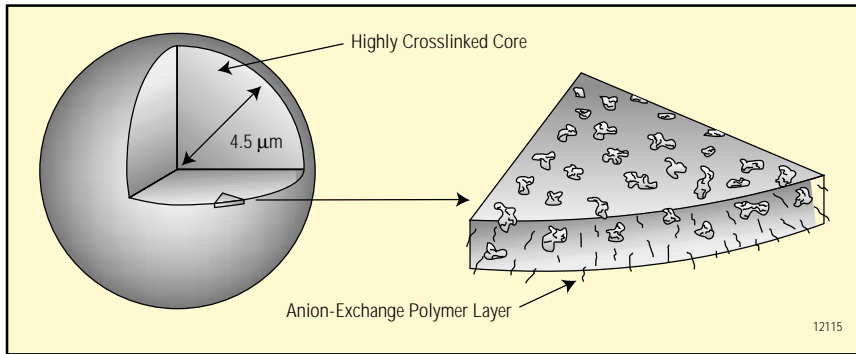


Figure 1. Structure of an IonPac AS14 packing particle.

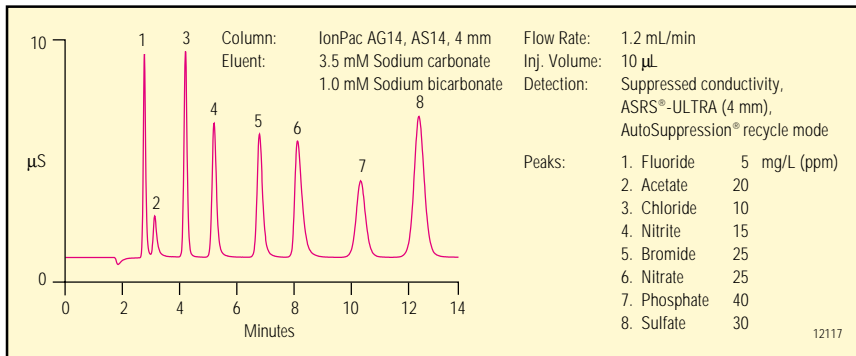


Figure 2. Isocratic separation of inorganic anions on an IonPac AS14 column in less than 13 minutes.

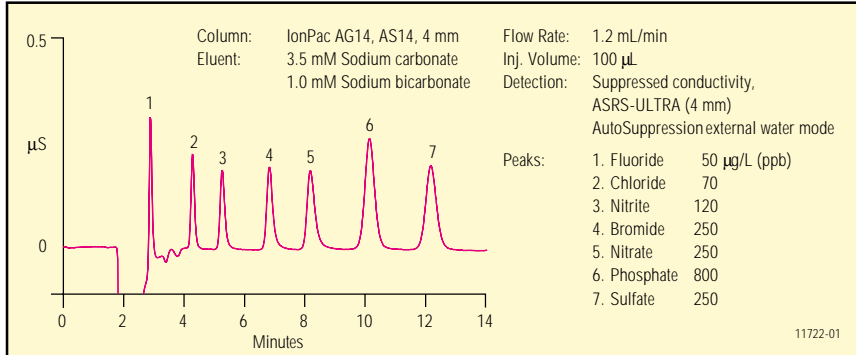


Figure 3. Determination of trace level anions in high-purity water using the IonPac AS14 with a large loop injection.

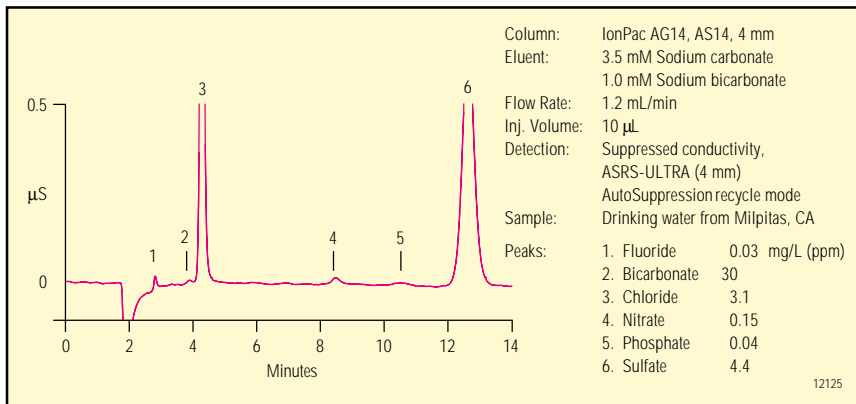


Figure 4. The IonPac AS14 column is ideal for interference-free determination of inorganic anions, including fluoride, in drinking water.

## High Efficiency Particle Structure

The IonPac AS14 packing is a unique structure composed of a highly crosslinked core and an anion-exchange layer grafted to the surface, as shown in Figure 1. The substrate for the IonPac AS14 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 anion-exchange layer has a controlled thickness resulting in excellent mass transfer characteristics and consequently very high efficiency peaks.

## Unique Selectivity and Increased Capacity

The IonPac AS14 has a unique selectivity and increased capacity compared to the IonPac AS4A. As shown in Figure 2, fluoride is well resolved from the system void and free from interference from acetate and formate. These features make the AS14 ideal for routine inorganic anion determinations. The increased capacity of the AS14 allows the injection of complex matrices or injection of up to 100 μL of sample, as shown in Figure 3.

## Ideal for the Determination of Inorganic Anions in Drinking Water and Wastewater

The IonPac AS14 is the ideal column for compliance monitoring of drinking water and waste water. The AS14 meets or exceeds the requirements of U.S. EPA Method 300.0(A). As shown in Figure 4, fluoride is easily separated from the system void and can be determined even at very low concentrations. The AS14 has significantly improved retention of fluoride compared to the IonPac AS4A, as illustrated in Figure 5.

## Determination of Inorganic Acids and Low Molecular Weight Organic Acids

Low molecular weight organic acids and mono- and divalent inorganic anions commonly encountered in the chemical and power industries can be determined in a single run. Figure 6 illustrates the separation of weakly retained anions such as fluoride, glycolate, acetate, and formate on the IonPac AS14 by using a sodium tetraborate gradient.

The AS14 can be used to evaluate the mass balance of drugs and synthetic peptide preparations. Figure 7 illustrates the use of the AS14 to determine the anionic counterion amount and type.

## Solvent Compatible Packing

Since the IonPac AS14 column is 100% HPLC solvent compatible, organic solvents can be used for efficient column clean-up or to enhance sample solubility. Users save time and money by eliminating time-consuming sample preparation steps. This feature allows complex matrices to be analyzed with minimal sample preparation and extends the utility of the column to new applications requiring solvents. Adding organic solvents to the eluent modifies column selectivity and enables the elution of nonpolar analytes or contaminants from the column.

## Economical Microbore Operation

The IonPac AS14 column is available in the 2-mm format to provide the advantages of reduced operating costs with microbore operation.

- Higher mass sensitivity compared to 4-mm separations. Ideal for limited sample volumes.
- Reduced mobile phase consumption (3–4 times).
- 4-mm applications can be directly transferred to the 2-mm format.

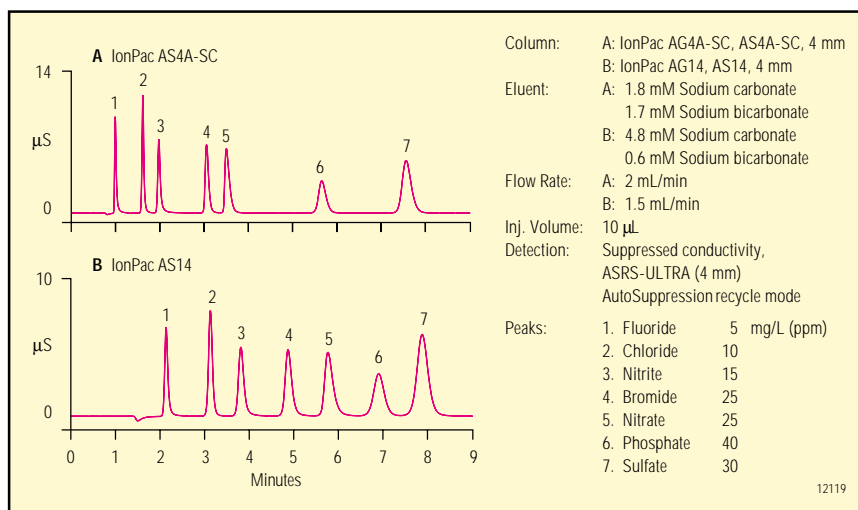


Figure 5. Fast isocratic elution of inorganic anions. The increased capacity and unique selectivity of the IonPac AS14 column allows the retention of fluoride out of the water dip while eluting sulfate in less than 9 minutes.

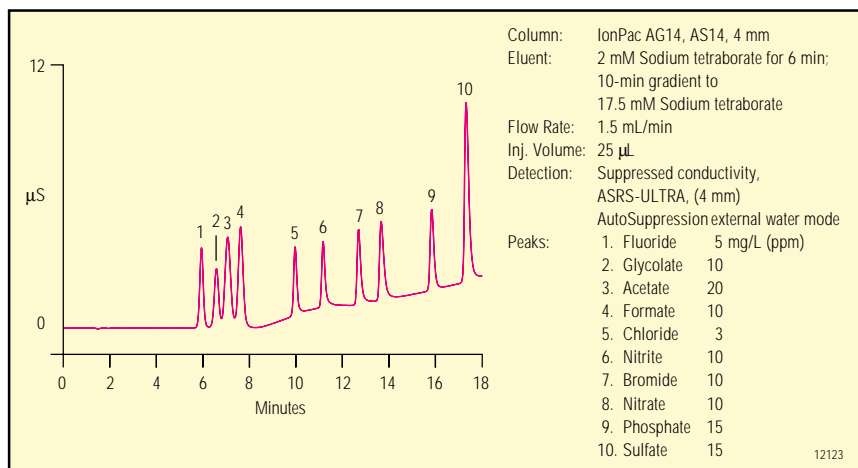


Figure 6. Sodium tetraborate gradient separation of anions using the IonPac AS14 column.

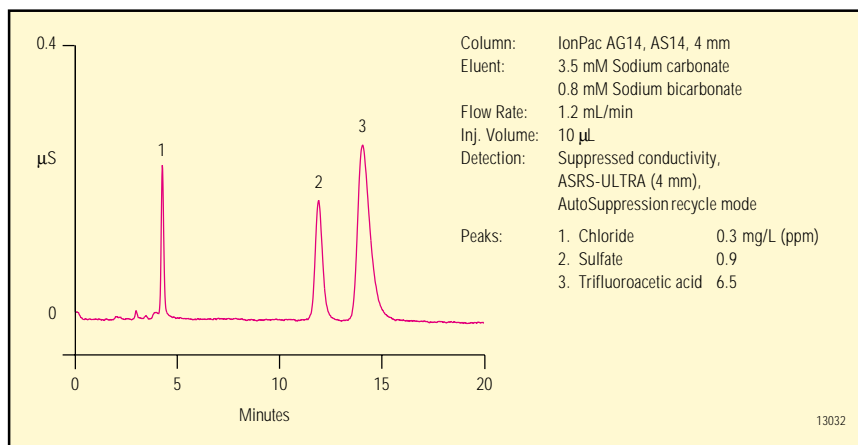


Figure 7. Determination of anionic counterions present in a gel permeation purified peptide.

## ORDERING INFORMATION

In the U.S., call 1-800-346-6390, visit <http://dstore.dionex.com>, or contact the Dionex regional office nearest you. Outside the U.S., order through your local Dionex office or distributor. Refer to the part numbers below.

For optimum ease-of-use and economy, the IonPac AS14 column should be used with the AAES Anion Atlas Electrolytic Suppressor or the Anion Self-Regenerating Suppressor (ASRS). The IonPac AS14 column offers improved performance for IonPac AS4A, IonPac AS4A-SC, and IonPac AS12A applications.

When performing sodium tetraborate gradient anion-exchange applications on the IonPac AS14, 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 AG14 guard, AMC-1 concentrator column, or TAC concentrator column when a single-piston pump such as the DQP or DXP-1 is used for sample delivery. Use the TAC-LP1 concentrator column when a syringe or autosampler is used for sample delivery. For 2-mm concentrator work, use the IonPac AG14 guard or the AMC-1 concentrator column when a single piston pump is used for sample delivery.

Description	Part Number
IonPac AS14 Analytical Column (4 x 250 mm).....	046124
IonPac AG14 Guard Column (4 x 50 mm).....	046134
IonPac AS14 Analytical Column (2 x 250 mm).....	046129
IonPac AG14 Guard Column (2 x 50 mm).....	046138
ATC-3 Anion Trap Column (9 x 24 mm) (for use with 4-mm columns) .....	059660
ATC-3 Anion Trap Column (4 x 35 mm) (for use with 2-mm columns) .....	079932

## SPECIFICATIONS

### Dimensions:

*Analytical:* 2 x 250 mm and  
4 x 250 mm

*Guard:* 2 x 50 mm and 4 x 50 mm

### Maximum Operating Pressure:

27.6 MPa (4000 psi)

### Mobile Phase Compatibility:

pH 2–11; 0–100% HPLC  
solvents

### Substrate Characteristics:

*Bead Diameter:* 9.0 µm

*Pore Size:* 100 Å

*Crosslinking (%DVB):* 55%

### Ion-Exchange Group:

Surface-functionalized alkyl  
quaternary ammonium ion

### Functional Group Characteristics:

Medium-high hydrophobic

### Capacity (µeq/column):

16 µeq (2 x 250 mm column)

65 µeq (4 x 250 mm column)

### Column Construction:

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



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