

The IonPac AS7 column is a high-capacity, high-efficiency hydrophobic anion-exchange column. A wide range of polyvalent anions can be separated with this column. Polyphosphates and other polyvalent complexing agents can be determined using acidic elution (eliminating metal interferences) with post-column derivatization and UV-Vis detection.

#### Key Applications for the IonPac AS7

- Polyphosphates
- Polyphosphonates
- Chelating agents
- Hexavalent chromium
- Cyanide
- Iodide
- Sulfide
- Arsenic speciation

#### Superior Chromatographic Performance

- High capacity: 100 µeq per column (4 × 250-mm column).
- Allows for the analysis of a variety of anions including polyvalent anions in high-ionic-strength matrices.
- Typically used with postcolumn reagents for photometric detection.
- Contains both anionic and cationic ion-exchange capacity.
- Can be used with a wide range of detectors—conductivity, photometry, amperometry.

#### Unique Polymeric Packing

The AS7 column has a unique polymer packing that provides superior performance for separating ionic and polar compounds. The patented packing offers high-speed, high-efficiency, and high-loading capacity at moderate backpressures.

Figure 1 is a diagram of the AS7 column packing. Three different regions exist in the IonPac ion-exchange packing, including:

- An inert, nonporous, chemically and mechanically stable core.
- A surface sulfonated region completely covering the core surface.
- An outer layer of permanently attached submicron anion-exchange MicroBeads™.

The latex anion-exchange layer has high-loading capacity with very short diffusion paths. These features combine to give high efficiency and minimal matrix effects. Several unique separations such as polyphosphates using the AS7 require both anion and cation retention. The AS7 anionic and cationic ion-exchange selectivities and capabilities are quality controlled to assure dependable performance.



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## Determination of Highly Charged Anions

The determination of highly charged anions such as ethylenediaminetetraacetic acid (EDTA), nitrilotriacetic acid (NTA), polyphosphates, and polyphosphonates is possible on the AS7 column with the postcolumn addition of ferric nitrate and UV detection. This method can be used to determine polyphosphates in a variety of matrices, including pharmaceutical and detergent samples, wastewaters, boiler waters, cooling waters, cleansers, and fertilizers.

The figure on page 1 and Figure 2 illustrate the determination of chelating agents and polyphosphonates using the AS7 column coupled with the postcolumn addition of ferric nitrate and UV detection at 330 nm.

## Use the AS7 Column with Amperometric Detection

The IonPac AS7 column can be used with a wide range of eluents and detectors. Figures 3, 4, and 5 illustrate the use of amperometric detection for the analysis of cyanide, sulfide, and iodide in various matrices. The combination of the high capacity AS7 column and amperometric detection provides a sensitive and selective method for the determination of these analytes in high-ionic-strength matrices such as 1 M sodium hydroxide and wastewater.

Amperometric detection can also be used for the analysis of chelating agents. Figure 6 shows the use of amperometric detection with a disposable platinum electrode for the analysis of chelating agents.

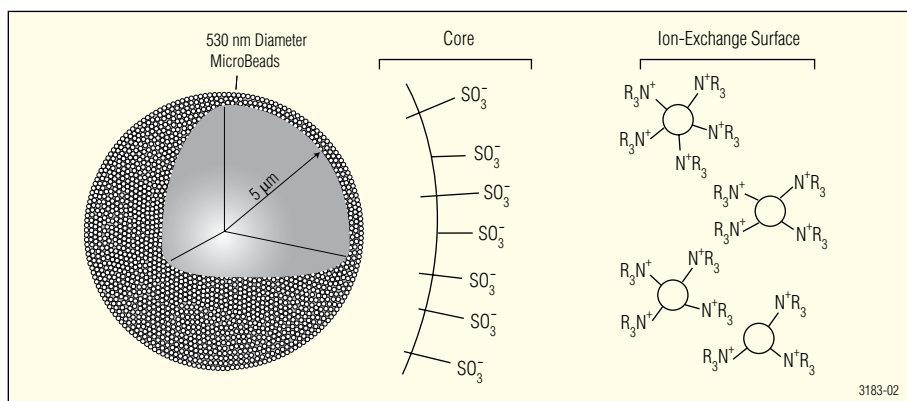


Figure 1. Pelicular structure of IonPac AS7 packing.

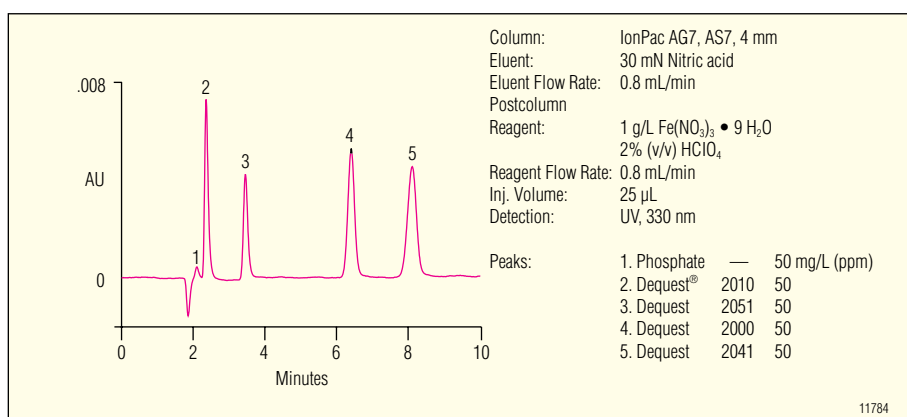


Figure 2. Determination of polyphosphonate scale inhibitors using the AS7 4-mm column.

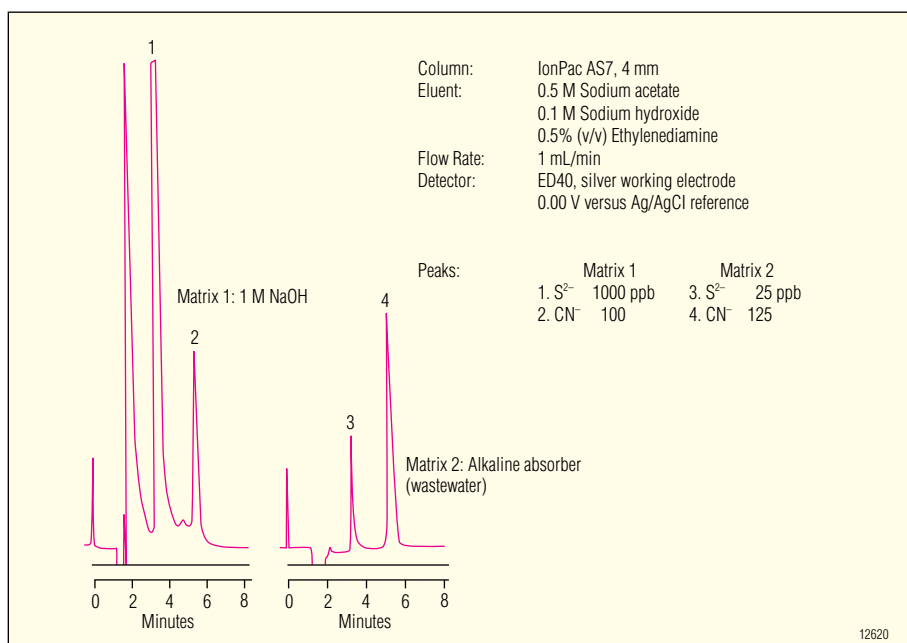


Figure 3. Determination of cyanide and sulfide in sodium hydroxide and wastewater samples using the AS7 4-mm column with amperometric detection.

### Use the AS7 Column with UV-Vis Detection

Hexavalent chromium, a known carcinogen, is determined by anion-exchange separation followed by post-column reaction and visible detection. Hexavalent chromium can be monitored in various environmental matrices, including wastewater, drinking water, ambient air, hazardous waste dump site soils, and leachates. The high capacity of the AS7 column makes it ideal for the determination of hexavalent chromium in high-ionic-strength matrices.

Figure 7 shows the separation of hexavalent chromium using the AS7 column with the postcolumn addition of diphenylcarbazide (DPC) and detection at 530 nm. This method is very selective and sensitive for hexavalent chromium.

### Use the AS7 Column with ICP-MS Detection

Ion-exchange chromatography has been used to separate inorganic and organic species of arsenic in drinking water and urine prior to detection by ICP-MS. Elements such as chloride, which interferes in the ICP-MS determination of these arsenic compounds, can be separated using ion-exchange chromatography.

Figure 8 demonstrates the separation of arsenic(III), arsenic(V), methylarsonic acid, benzenearsonic acid, and dimethylarsinic acid using the AS7 column with an ammonium phosphate gradient and ICP-MS detection.

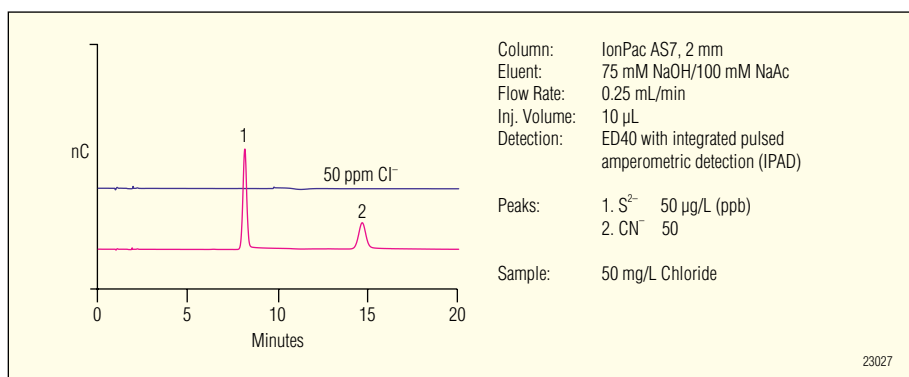


Figure 4. Determination of cyanide and sulfide using the AS7 2-mm column with amperometric detection and a disposable silver electrode.

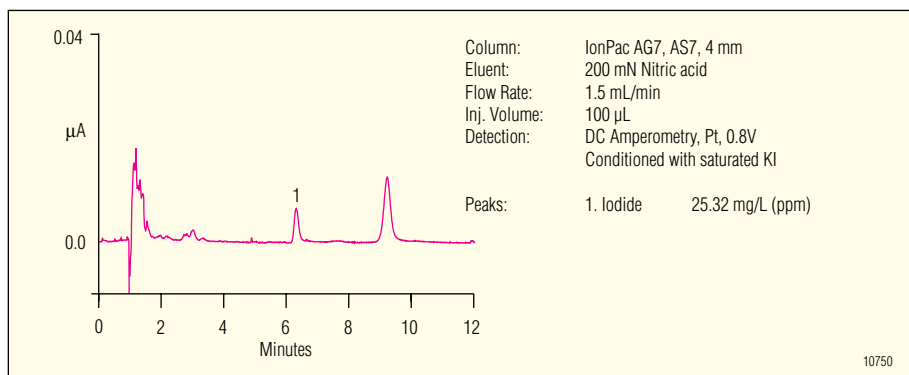


Figure 5. Determination of iodide in evaporated skim milk using dc amperometry.

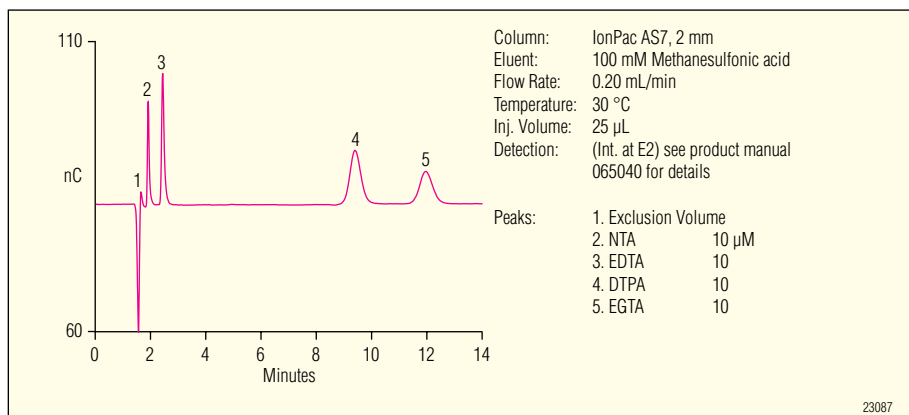


Figure 6. Determination of chelating agents using the AS7 2-mm column with amperometric detection and a disposable platinum electrode.

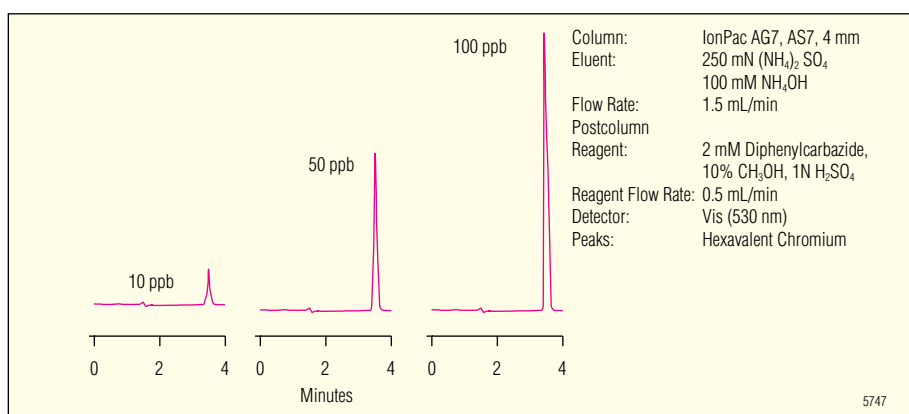


Figure 7. Separation of hexavalent chromium using the AS7 column with postcolumn addition of diphenylcarbazide coupled with Vis detection.

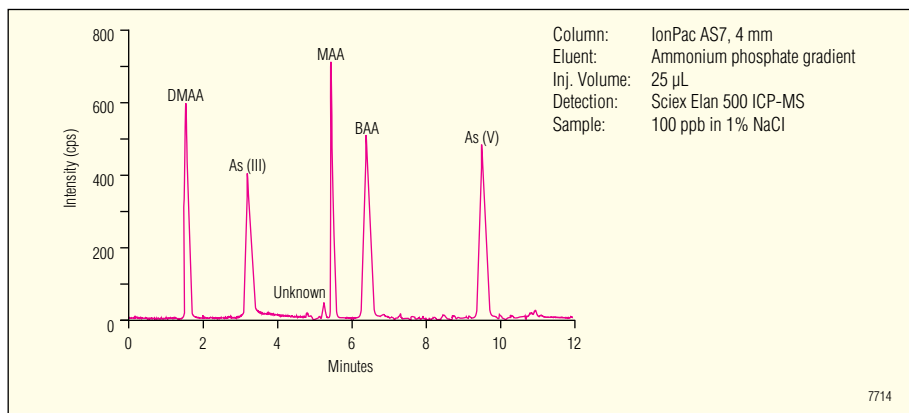


Figure 8. Arsenic speciation using the AS7 4-mm column coupled with ICP-MS detection.

### SPECIFICATIONS

#### Analytical Column Dimensions

IonPac AS7 Column: 4 × 250 mm,  
2 × 250 mm

#### Guard Column Dimensions

IonPac AG7 Column: 4 × 50 mm,  
2 × 50 mm

#### Maximum Operating Pressure:

4000 psi (26 MPa)

#### Mobile Phase Compatibility:

pH 0–14

#### Column Construction:

PEEK with internal style 10-32  
threaded ferrule-style end  
fittings. All components are  
non-metallic.

#### Substrate Characteristics:

Particle Diameter: 10 µm  
Cross-linking (%DVB): 2%

#### Latex Characteristics:

##### Functional Groups:

Alkyl quaternary ammonium  
Latex Cross-linking: 5%  
Latex Diameter: 530 nm

#### Capacity:

100 µeq (4 x 250 mm column)  
25 µeq (2 x 250 mm column)

### ORDERING INFORMATION

In the U.S., call 1-800-346-6390 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.

Description	Part Number
IonPac AS7 Analytical Column (4 × 250 mm) .....	035393
IonPac AG7 Guard Column (4 × 50 mm) .....	035394
IonPac AS7 Analytical Column (2 × 250 mm) .....	063097
IonPac AG7 Guard Column (2 × 50 mm) .....	063099

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