



Product Data Sheet

AmberSep™ IRC747 UPS Chelating Resin

Industrial-grade, Uniform Particle Size, Chelant for Chemical Processing

Description

AmberSep™ IRC747 UPS Chelating Resin is a uniform particle size resin of macroporous structure. Its polystyrenic matrix, crosslinked with divinylbenzene, contains amino-phosphonic groups. The chemical nature of these groups is such that they form complexes with metal ions. The narrow particle size distribution affords an exceptional pressure drop profile.

AmberSep™ IRC747 UPS features very high operating capacity for calcium and is especially useful when treating brines that do not have a very high strontium content. Under these conditions, the resin offers an improved cycle time, displaying also very good removal efficiency for barium and strontium.

AmberSep™ IRC747 UPS is also used for metal recovery in hydrometallurgical applications.

Applications

- Chlor-alkali (brine purification)
- Zinc separation
- Lead separation

Typical Properties

Physical Properties

| | |
|------------------|--|
| Copolymer | Styrene-divinylbenzene |
| Matrix | Macroporous |
| Type | Chelant |
| Functional Group | $-\text{CH}_2-\text{NH}-\text{CH}_2-\text{PO}_3-\text{Na}_2$ |
| Physical Form | Beige, hard, opaque, spherical beads |

Chemical Properties

| | |
|--------------------------|--------------------------|
| Ionic Form as Shipped | Na^+ |
| Total Exchange Capacity | $\geq 1.75 \text{ eq/L}$ |
| Water Retention Capacity | 64 – 69% |

Particle Size §

| | |
|------------------------|--------------------------|
| Particle Diameter | $550 \pm 50 \mu\text{m}$ |
| Uniformity Coefficient | ≤ 1.2 |

Stability

| | |
|----------|---|
| Swelling | $\text{H}^+ \rightarrow \text{Na}^+ : 45\%$ |
|----------|---|

Density

| | |
|------------------|------------------|
| Particle Density | 1.10 – 1.14 g/mL |
| Shipping Weight | 755 g/L |

§ For additional particle size information, please refer to the [Particle Size Distribution Cross Reference Chart](#) (Form No. 45-D00954-en).

Suggested Operating Conditions

| | |
|------------------------------------|---|
| Maximum Operating Temperature | 80°C (180°F) in non-aqueous media |
| Operating pH Range | Depends on the application |
| Bed Depth, min. | 700 mm (2.3 ft) |
| Operating Flowrate | Up to 40 BV*/h (5 gpm/ft ³) |
| Regeneration | 1 – 2N HCl |
| Conversion to Na ⁺ form | 1 – 4% NaOH at flowrate of 2 – 4 BV/h |

* 1 BV (Bed Volume) = 1 m³ solution per m³ resin or 7.5 gal per ft³ resin

Hydraulic Characteristics

Bed expansion of AmberSep™ IRC747 UPS Chelating Resin as a function of backwash flowrate and fluid specific gravity is shown in Figure 1.

Pressure drop data for AmberSep™ IRC747 UPS as a function of service flowrate at 40°C (104°F) in brine is shown in Figure 2.

Figure 1: Backwash Expansion

Specific gravity = 1.00, 1.10, 1.17

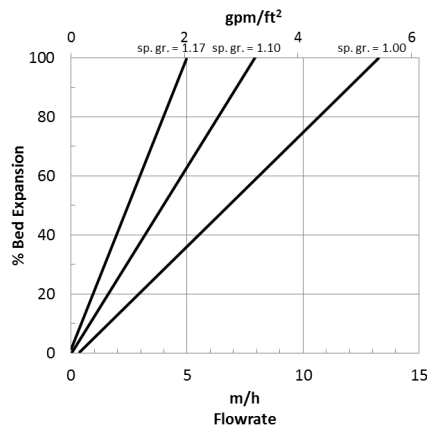
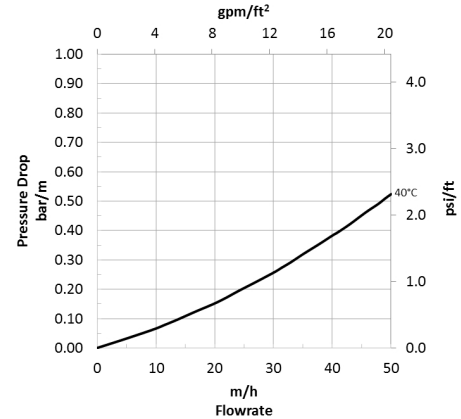


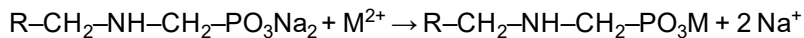
Figure 2: Pressure Drop

Brine temperature = 40°C (104°F)

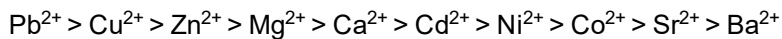


Application Information

The characteristic reaction of AmberSep™ IRC747 UPS Chelating Resin is:



The relative affinity of this resin for the various cations decreases in the order shown below:



The resin can operate in a neutral, acidic, or alkaline medium, but since its capacity depends on the pH, the following minimum pH values are recommended for various cations:

| Minimum pH | 2 | 2.5 | 3 | 4.5 |
|------------|------------------|------------------|------------------|------------------|
| Cations | Cu ²⁺ | Zn ²⁺ | Cd ²⁺ | Mg ²⁺ |
| | Pb ²⁺ | | Ca ²⁺ | Ni ²⁺ |
| | | | | Co ²⁺ |

Application Information (Cont.)

AmberLite™ IRC747 UPS Chelating Resin is a very efficient resin for:

Brine Purification

- Removal of Ca, Mg, and other metals present in trace quantities (a few ppm) in concentrated brine, e.g., chlor-alkali electrolysis

Zinc Separation

- Separation of zinc from media; for example, in corrosion preventive products in cooling towers

Lead Separation

- Separation of lead from industrial effluents, such as waste from oil refineries and battery factories, or solvents and wastes from the manufacture of paints and printing inks

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Please be aware of the following:

- **WARNING:** Oxidizing agents such as nitric acid attack organic ion exchange resins under certain conditions. This could lead to anything from slight resin degradation to a violent exothermic reaction (explosion). Before using strong oxidizing agents, consult sources knowledgeable in handling such materials.

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