Product Data Sheet

AMBERSEP™ M4195 and AMBERSEP™ M4195 UPS Chelating Resins

Industrial-grade Chelants for Copper, Nickel, and Cobalt Processing

Description

AMBERSEP™ M4195 and AMBERSEP™ M4195 UPS Chelating Resins exhibit an optimal selectively for capturing transition metal ions (for example, copper and nickel) from solutions with pH less than 2, or in the presence of homogeneous chelating agents such as EDTA. The chemistry of these chelants is based upon a special multi-dentate amine ligand which is partially quaternized by sulfuric acid. When in this conjugate sulfuric acid salt form, the resin—fully swollen and hydrated—is ready for scavenging metals from acidic media.

Most metal process streams requiring separation and purification can typically be treated with standard iminodiacetic acid or aminophosphonic chelating resins. However, the more complex, challenging electrolytes require the higher selectivity of AMBERSEP™ M4195 or AMBERSEP™ M4195 UPS.

AMBERSEP™ M4195 Chelating Resin, with its screened particle size (through 20 U.S. Mesh, on 50 U.S. Mesh), is the standard grade of this product.

AMBERSEP™ M4195 UPS Chelating Resin, with its uniform particle size, provides enhanced performance for continuous ion exchange systems.

Applications

- Electroplating
- Microelectronic etching solutions
- Cobalt electrolyte purification
- Copper/nickel recovery from nickel laterite
- Copper/nickel recovery from raffinates

Typical Properties

Physical Properties	
Copolymer	Styrene-divinylbenzene
Matrix	Macroporous
Type	Chelant
Functional Group	Bis-Picolylamine
Physical Form	Tan to dark brown to dark green, opaque, spherical beads

	AMBERSEP™ M4195	**AMBERSEP™ M4195 UPS**
Chemical Properties		
Ionic Form as Shipped	Weak base/Partial H_2SO_4 salt	Weak base/Partial H_2SO_4 salt
Copper Loading [‡]	≥ 35 g/L	≥ 35 g/L
Water Retention Capacity	40 – 60%	40 – 60%
Particle Size [§]		
Particle Diameter	297 – 841 µm	~ 410 µm
< 300 µm	≤ 1%	
> 1180 µm	≤ 3%	
Density		
Shipping Weight	670 g/L	670 g/L

[‡] 6 g Cu/L feed, pH 2

[§] For additional particle size information, please refer to the Particle Size Distribution Cross Reference Chart (Form No. 177-01775).

Form No. 177-03695, Rev. 1
August 2019

Application Information

Relative loading values of various metals for AMBERSEP™ M4195 and AMBERSEP™ M4195 UPS Chelating Resins are shown in Figure 1, and selected values of the same are shown in Table 1. The resin exhibits an extremely strong affinity for copper, even at low pH, whereas other metals have higher loading values at higher pH.

Complexed metals can be removed with strong acid (10N H_2SO_4) or ammonium hydroxide. Sometimes selective elution can be accomplished using varying strengths of acid.

Figure 1: Selectivity vs. pH

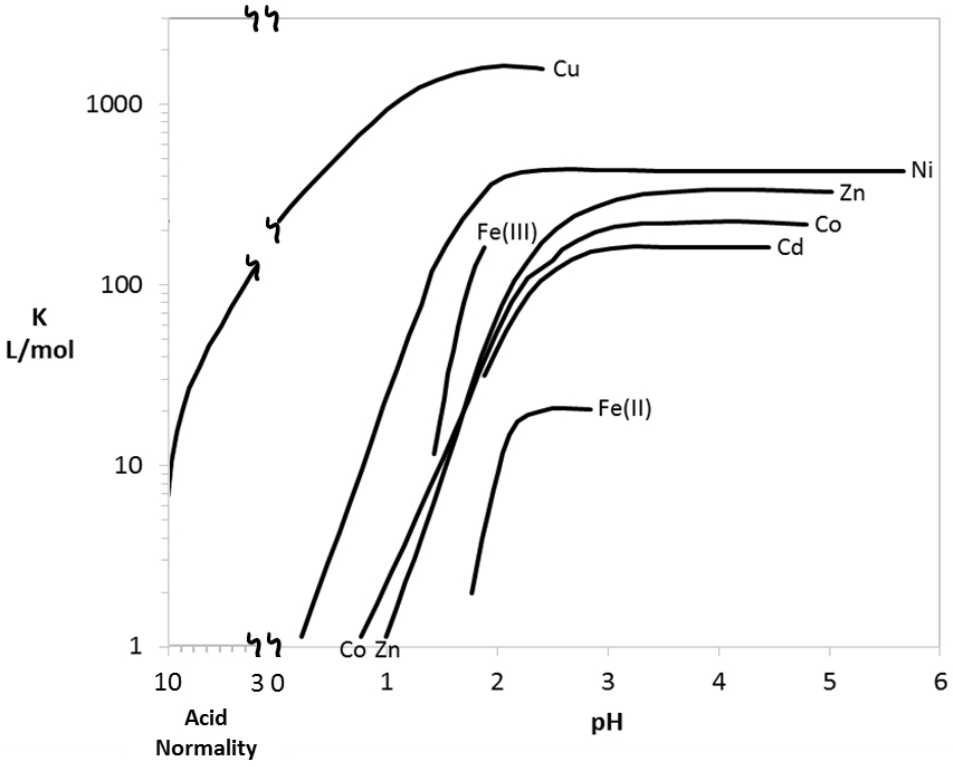

Table 1: Conditional absorption constants (K) for AMBERSEP™ M4195 and AMBERSEP™ M4195 UPS Chelating Resins

Metal Ion	pH	K (L/mol)
Cu^{2+}	2.0	1280
Ni^{2+}	2.0	375
U^{6+}	2.0	190
Fe^{3+}	2.0	181
Zn^{2+}	2.0	82
	2.7	184
Co^{2+}	2.0	51
	3.2	280
Cd^{2+}	2.0	43
	2.8	196
Fe^{2+}	2.3	23

Form No. 177-03695, Rev. 1
August 2019

Product Stewardship

DuPont has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with DuPont products—from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

Customer Notice

DuPont strongly encourages its customers to review both their manufacturing processes and their applications of DuPont products from the standpoint of human health and environmental quality to ensure that DuPont products are not used in ways for which they are not intended or tested. DuPont personnel are available to answer your questions and to provide reasonable technical support. DuPont product literature, including safety data sheets, should be consulted prior to use of DuPont products. Current safety data sheets are available from DuPont.

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.

LENNTECH
Water Treatment Solutions
info@lenntech.com Tel. +31-152-610-900
www.lenntech.com Fax. +31-152-616-289

DUPONT™

Form No. 177-03695, Rev. 1
August 2019