

PRODUCT INFORMATION

Chromalite[®] CGA and CGC ion exchange resins

Presents an overview of Chromalite CGA and CGC chromatographic ion exchange resins for small organic and inorganic compound separation and purification.

CHROMALITE CGA AND CGC RESINS

Inside this Product Information Guide you will find an overview of Chromalite CGA and CGC resins. For more detailed information on any product or to find a product for an application not mentioned, please go to www.purolite.com or contact the Purolite office closest to you, listed on the back cover.

INTRODUCTION

Founded in 1981, Purolite is a leading manufacturer of ion exchange, catalyst, adsorbent and specialty resins. With global headquarters in the United States, Purolite is the only company that focuses 100% of its resources on the development and production of resin technology.

Responding to the needs of our customers, Purolite has built the largest technical sales force in the industry, the widest variety of products and five strategically located Research and Development groups. Our ISO 9001 certified manufacturing facilities in the U.S.A, Romania and China, combined with more than 40 sales offices in 30 countries, ensure complete worldwide coverage.



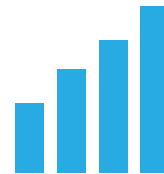
PREMIER PRODUCTS

The quality and consistency of our products is fundamental to our performance. Throughout all Purolite plants, production is carefully controlled to ensure that our products meet the most stringent criteria, regardless of where they are produced.



RELIABLE SERVICE

We are technical experts and problem solvers. Reliable and well trained, we understand the urgency required to keep businesses operating smoothly. Purolite employs the largest technical sales organization in the industry.



INNOVATIVE SOLUTIONS

Our continued investment in research & development means we are always perfecting and discovering innovative uses for ion exchange resins and adsorbents. We strive to make the impossible possible.

PUROLITE PRODUCT INFORMATION

CHROMALITE CGA AND CGC RESINS

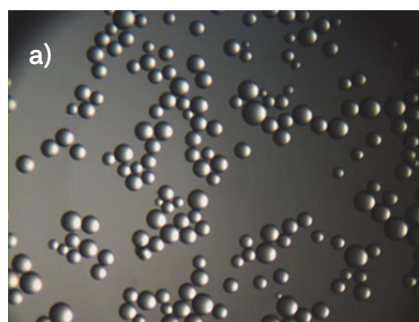
Purolite Chromalite® CGA and CGC resins are spherical, uniform and highly purified chromatographic ion exchange resins for column separations covering all ranges of particle sizes and applications, from laboratory to plant scale. This range of styrenic resins is produced by a proprietary manufacturing technology that creates whole, perfectly spherical beads with exceptional kinetic and packing properties for chromatographic separations.

Particle size and permeability

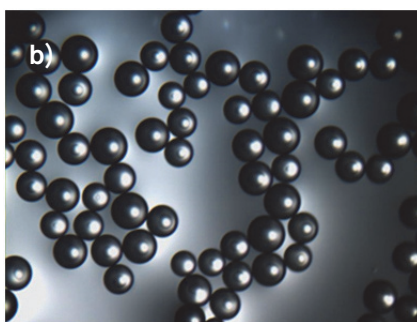
Chromalite CGA and CGC products are manufactured in three different particle sizes, with 90% of beads in the specified range:

- 35 – 75 micron (200 – 400 mesh)
- 75 – 150 micron (100 – 200 mesh)
- 150 – 300 micron (50 – 100 mesh)

Figure 1 – Microscopic images of typical Chromalite CGA resins

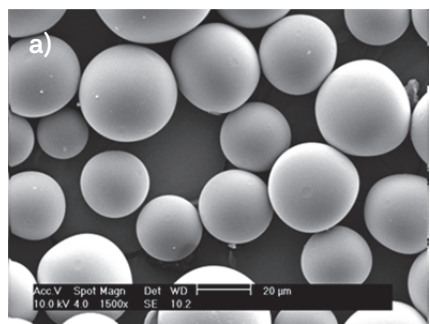


CGA100X2

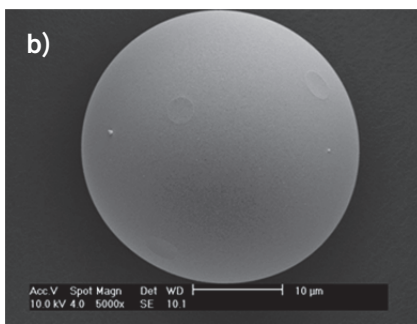


CGA200X8

Figure 2 – Scanning microscopy images for Chromalite CGC50X8



Consistent, uniform bead size

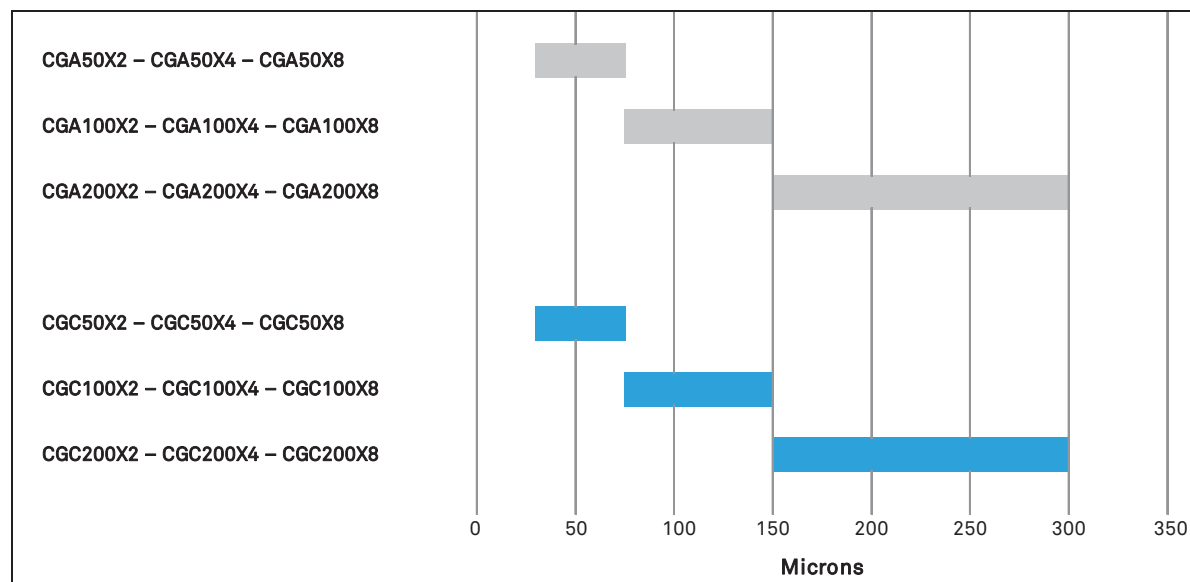


Perfect spherical bead shape

Strict control of the polymerization process ensures tight regulation of the particle size and eliminates the presence of undesired fines in the final product. The consistent particle size and perfect shape of Chromalite CGA and CGC resins (see Figure 1 and Figure 2) provide reproducible results, performing reliably for laboratory separations as well as fine chemical and pharmaceutical column separations. The consistency also helps to simplify adjustments necessary during process scale-up, ensuring that success in the laboratory translates into success with pilot-scale and full-scale plant operations.

Chromalite CGA and CGC are manufactured using 2%, 4% and 8% divinylbenzene (DVB) crosslinking to allow the selection of the best resin for a particular process with optimum levels of permeability, water retention capacity and total exchange capacity. Additionally, bead size uniformity allows the preparation of columns with low back pressure, excellent mass transfer rate and separation profile.

Figure 3 – Particle size range available for Chromalite CGA and CGC products



Structure

The Chromalite CGC and CGA polymer backbone is styrene crosslinked with various percentages of divinylbenzene (DVB). Controlled polymerization and high-quality raw materials provide robust resin beads that are stable to the full pH scale, with maximum resistance to oxidative or reductive reactions. The beads withstand mechanical wear and breakage, and achieve good chemical stability in all common organic solvents. The gel-like structure of the resin beads with strong anion or cation functional groups at their surface provides high-performance chromatographic separation for a wide range of compounds.

Chromalite CGA grade resins are polystyrenic gel beads, functionalized with trimethylamine with a chloride counter-ion.

Chromalite CGC grade resins are polystyrenic gel beads, functionalized with sulfonic acid groups with a hydrogen counter-ion.

Chromalite CGA grade resins have quaternary amine groups. By varying the degree of crosslinking, the bead size and the exchange capacity, the efficiency and the resolution in the separation of nucleotides, carboxylic acids, sugars, carbohydrates and other anionic substances are controlled and can be optimized.

Chromalite CGC grade resins are functionalized with sulfonic acid groups. By varying the degree of crosslinking, bead size, exchange capacity, efficiency and resolution in the separation of amino acids, carbohydrates, sugars, organic acids and amines and other cationic substances are controlled and can be optimized.

To facilitate the column packing process, we supply Chromalite CGA and CGC resins in wet form.

Selection

To facilitate the choice of the best ionic exchange chromatographic resin for your application, the range of Chromalite CGA and CGC products and their technical specifications is summarized in Table 1 and Table 2.

Typical applications

Performance of ion exchange resins is largely dependent on process operating conditions. Testing resin under actual operating conditions is recommended.

Chromalite CGA resins in inorganic, organic and biological applications

Inorganic

- Gold in Iron ore samples is separated from Iron, Antimony and Vanadium
- Uranium removal from contaminated groundwater
- Determination of Selenium in samples with high Copper and Iron contents
- Determination of low levels of alpha-radioemitters in waste waters (²³⁸Pu, ²⁴¹Am, ²⁴²Cm, ³⁴⁴Cm, ^{234/238}U)
- Determination of Rhodium in samples containing trace levels
- Copper, Zinc and Manganese determination in saline samples
- Separation and determination of Ruthenium, Rhodium, Palladium, Iridium, Platinum and Gold in geological samples
- Isolation of nitrate and ammonia from water for isotopic ¹⁵N characterization

Organic

- Isolation of aminoglycosidic antibiotic complex (butirosin)
- Adsorption of organotrifluoroborates for applications in radioiodination reactions
- Chromatographic determination of non-volatile organic acids in apple juices (malic acid, citric acid, succinic acid, and other as chlorogenic, shikimic and quinic acids)

Biological

- NAD purification
- Determination of Sb(III) and Sb(V) in meglumine antimoniate (drug)
- Fractionation of alcoholic plant extracts into acidic, basic, and non-ionic (or neutral) substances
- Chromatographic determination of quinolinic acid, uronic acid, aldobiuronic acid
- Separation of deoxyribonucleosides in human urine

Table 1 – Chromalite CGA anion resins

CHROMALITE PRODUCT	FUNCTIONAL GROUP	IONIC FORM	CHROMALITE PARTICLE SIZE* (90% in range)	TEC** (meq/ml)
CGA50X2	-N(CH ₃) ₃ ⁺	Cl ⁻	35 – 75 µm; 200 – 400 mesh	0.6
CGA50X4	-N(CH ₃) ₃ ⁺	Cl ⁻	35 – 75 µm; 200 – 400 mesh	1.0
CGA50X8	-N(CH ₃) ₃ ⁺	Cl ⁻	35 – 75 µm; 200 – 400 mesh	1.2
CGA100X2	-N(CH ₃) ₃ ⁺	Cl ⁻	75 – 150 µm; 100 – 200 mesh	0.6
CGA100X4	-N(CH ₃) ₃ ⁺	Cl ⁻	75 – 150 µm; 100 – 200 mesh	1.0
CGA100X8	-N(CH ₃) ₃ ⁺	Cl ⁻	75 – 150 µm; 100 – 200 mesh	1.2
CGA200X2	-N(CH ₃) ₃ ⁺	Cl ⁻	150 – 300 µm; 50 – 100 mesh	0.7
CGA200X4	-N(CH ₃) ₃ ⁺	Cl ⁻	150 – 300 µm; 50 – 100 mesh	1.0
CGA200X8	-N(CH ₃) ₃ ⁺	Cl ⁻	150 – 300 µm; 50 – 100 mesh	1.2

* Wet weight basis ** TEC = total exchange capacity

All resins supplied wet and do not require treatment before use.

Typical moisture is 40 – 80% depending on the crosslinking level

The standard packing is 50g, 500g, 1kg and 5kg

Chromalite CGC resins in inorganic, organic and biological applications

Inorganic

- Recovery of Palladium from HCl solutions containing competing ions
- Isolation and concentration of Cd, Co, Cu, Zn, for plasma atomic emission spectrometric emission
- Recovery of Palladium from HCl solutions containing interferences
- Quantitative recovery of Yttrium
- Strontium adsorption from sulfuric acid solution
- Separation of Ag(I), Mn(II), Co(II), Ni(II), Cu(II), Zn(II), Cd(II) and Fe(III) mixtures
- Isolation of ammonia from water for isotopic ¹⁵N characterization
- Na-montmorillonite/H-montmorillonite cation exchange
- Removal of ammonia ions from water
- Isolation of fluoride complexes of Hafnium (IV)

Organic

- Removal of amino acids and organic acids from beer
- Isolation of histidine analogues
- Sucrose analysis
- Extraction and separation of glutamic acid from other amino acids
- Fructose, mannitol and sorbitol was continuously separated
- Removal of amino acids and organic acids from beer
- Isolation of amino acids from sea water
- Purification of radiolabeled arginine
- Isolation and characterization of low-molecular weight soluble assimilates formed during ¹⁴CO₂ photosynthesis

Biological

- Isolation of 3-methoxytyramine in brain tissue
- Hydroxyproline isolation from urine solutions
- Isolation and quantification of 2-hydroxyethylidium 2-OH-E(+), in cellular systems
- NAD purification
- Separation of alkaloids from urine
- Purification of hyaluronic acid synthetic derivatives
- Isolation of radiolabelled citrulline produced by mitochondria
- Fractionation of alcoholic plant extracts into acidic, basic, and non-ionic (or neutral) substances

Table 2 – Chromalite CGC cation resins				
CHROMALITE PRODUCT	FUNCTIONAL GROUP	IONIC FORM	CHROMALITE PARTICLE SIZE* (90% in range)	TEC** (meq/ml)
CGC50X2	-SO ₃ ⁻	H ⁺	35 – 75 µm; 200 – 400 mesh	0.6
CGC50X4	-SO ₃ ⁻	H ⁺	35 – 75 µm; 200 – 400 mesh	1.1
CGC50X8	-SO ₃ ⁻	H ⁺	35 – 75 µm; 200 – 400 mesh	1.7
CGC100X2	-SO ₃ ⁻	H ⁺	75 – 150 µm; 100 – 200 mesh	0.6
CGC100X4	-SO ₃ ⁻	H ⁺	75 – 150 µm; 100 – 200 mesh	1.1
CGC100X8	-SO ₃ ⁻	H ⁺	75 – 150 µm; 100 – 200 mesh	1.7
CGC200X2	-SO ₃ ⁻	H ⁺	150 – 300 µm; 50 – 100 mesh	0.6
CGC200X4	-SO ₃ ⁻	H ⁺	150 – 300 µm; 50 – 100 mesh	1.1
CGC200X8	-SO ₃ ⁻	H ⁺	150 – 300 µm; 50 – 100 mesh	1.7

* Wet weight basis ** TEC = total exchange capacity
 All resins supplied wet and do not require treatment before use.
 Typical moisture is 40 – 80% depending on the crosslinking level
 The standard packing is 50g, 500g, 1kg and 5kg

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