

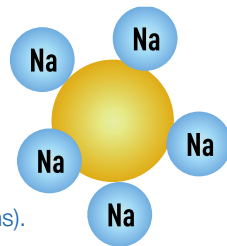
ION EXCHANGE RESIN

EDITION FOR
ABCO CATALOG



ION EXCHANGE RESIN

Ion exchange resins are insoluble matrix polymer compounds with functional groups (active groups with exchange ions).

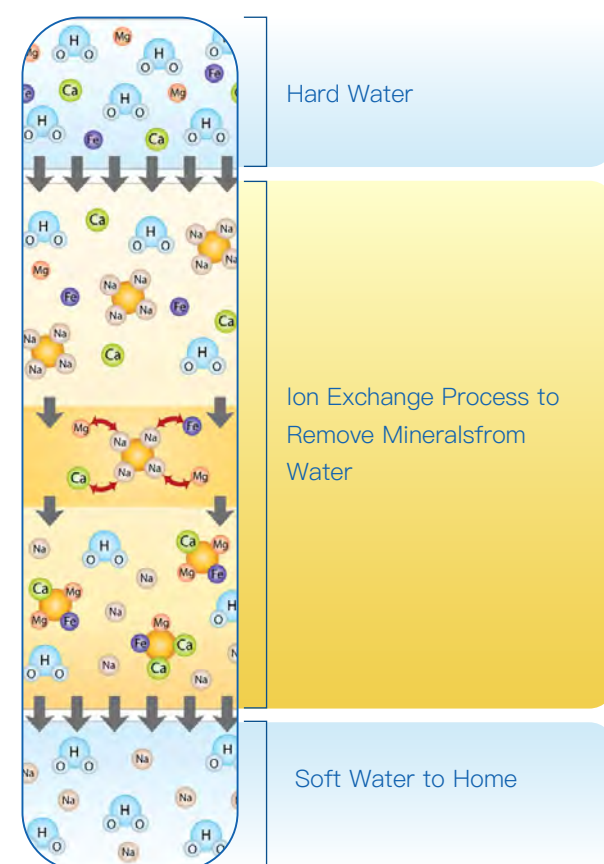


It generally contains one or several chemically active groups, i.e., exchange functional groups. These groups dissociate certain cations (such as H^+ or Na^+) or anions (such as OH^- or Cl^-) in aqueous solution, while adsorbing other cations or anions originally existing in the solution. That means the ions in the resin exchange with the ions in the solution, thus separating the ions in the solution.



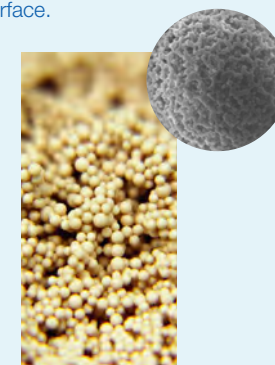
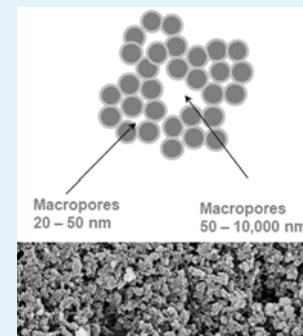
Cation exchange resins are one of the most commonly used resins for water softening. With a large amount of sodium ions attached to it, it achieves ion exchange through the contact between the resin and the water, thereby softening the water!

When the water contains a host of calcium and magnesium ions, ion exchange resins release numerous sodium ions to adsorb calcium and magnesium ions in the water. In this way, calcium and magnesium ions in the water are gradually reduced, and the water hardness also decreases accordingly, hard water becomes soft water as well.



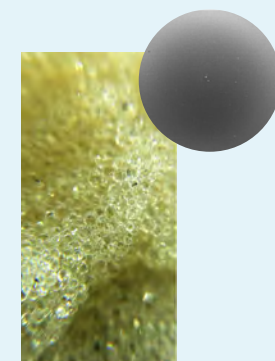
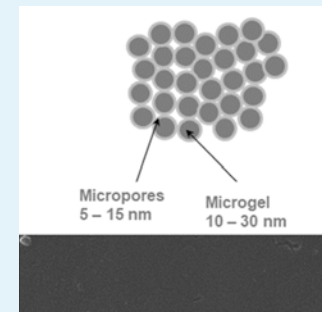
Macroporous Ion Exchange Resin

Pore-forming agent is added during the production process to form numerous capillary pores. The gel backbone is divided into a non-homogeneous gel structure by pore channels. In the particles, there are both gel pores and capillary pores. It has large pore sizes ranging from a few nanometers to several hundred nanometers. In addition, it has an opaque appearance and a rough surface.



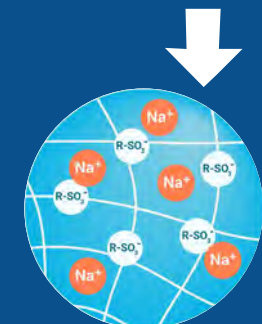
Gel Ion Exchange Resin

Smooth surface, no large pores in the beads. The gap between molecular chain is 2-4 nm.



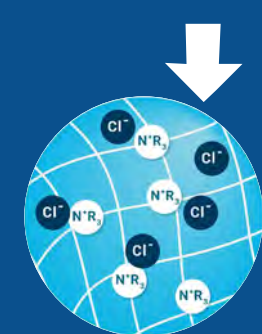
Cation Exchange Resin

It contains acidic groups (mostly $-COOH$), and can dissociate cations in the solution. Macroporous ion exchange resin has opaque appearance and rough surface.



Anion Exchange Resin

It contains basic groups (usually $(R_4N)^+$) and can dissociate anions in the solution.



NAMING SYSTEM

Styrene Series Macroporous Strong Acid Cation Exchange Resin

D001×7MBNR

D

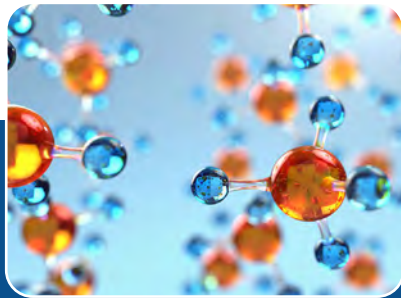
Macroporous Resin



Ion exchange resins are divided into gel type and macroporous type. For macroporous resins with a physical functional pore structure, a "D" is added before the full name to show the difference.

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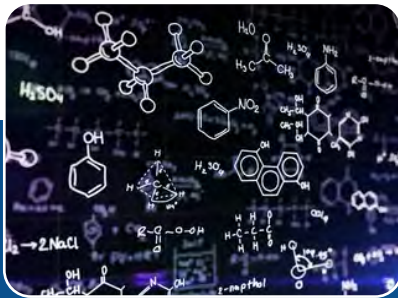
Functional Group Classification



- 0—strong acid— SO_3H , etc
- 1—weak acid— COOH , PO_3H_2
- 2—strong base— $(\text{R}_4\text{N})^+$, etc.
- 3—weak base— NH_2 , NHR , NR_2 , etc.
- 4—chelating— $\text{CH}_2\text{N}(\text{CH}_2\text{COOH})_2$, etc.
- 5—amphoteric— $(-\text{N}^+(\text{CH}_3)_3, -\text{COOH})$
 $(-\text{NH}_2, -\text{COOH})$
- 6—oxidation-reduction
— CH_2SH , $\text{C}_6\text{H}_3(\text{OH})_2$, etc.

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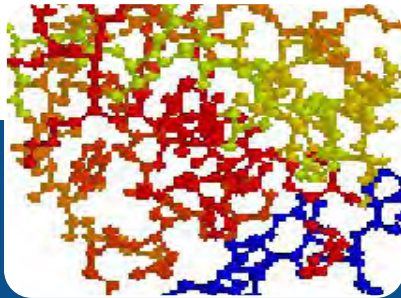
Backbone Classification



- 0—Styrene series
- 1—Acrylic acid series
- 2—Phenolic aldehyde series
- 3—Epoxy series
- 4—Vinyl pyridine series
- 5—Urea formaldehyde series
- 6—Vinyl chloride series

1×7

Sequence Number

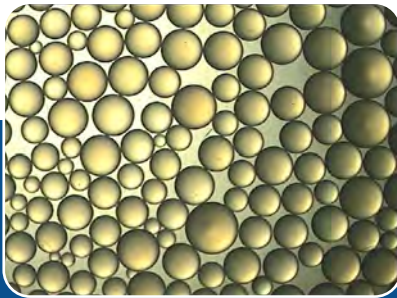


Sequence number is used to distinguish groups, cross-linking agents, etc.

The degree of cross linking is indicated by an "X" linkage number. In case of the secondary polymerization or the degree of cross-linking is not clear, the approximate value can be used or neglected.

MR

Resin Bed Application Code



- R—Softening bed
- SC—Bunk bed
- FC—Floating bed
- MB—Mixed bed
- MBP—Condensate mixed bed
- P—Condensate single bed
- TR—Triple-layer mixed bed

NR

Special Use Code



- NR—Nuclear grade resin
- ER—Electronic grade resin
- FR—Food grade resin

Styrene Series

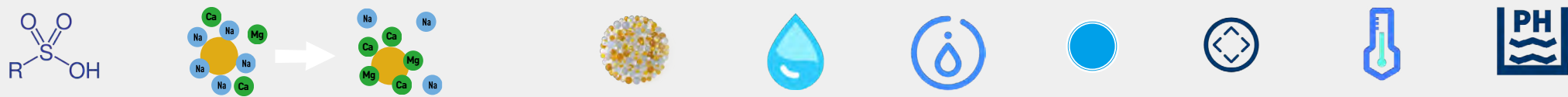
Gel Strong Acid Cation Exchange Resin



												
	Functional Groups	Ionic form	Mass exchange capacity	Volume exchange capacity	Particle size range (0.315-1.25mm)	Moisture content	Bulk density (g/ml)	Sphericity after attrition	Reversible swelling	Temperature limit	PH range	Applications
001 × 4	-SO ₃ H	Na	≥ 4.5	≥ 1.3	≥ 95	55.0–65.0	0.74–0.84	≥ 90	Na → H 22–55	(H) 100 (Na) 120	1–14	Used in extracting of antibiotics, pharmaceutical process, preparation of pure water or high purity water and soon.
001 × 7	-SO ₃ H	Na	≥ 4.5	≥ 1.9	≥ 95	45.0–50.0	0.77–0.87	≥ 90	Na → H ≤10	(H) 100 (Na) 120	1–14	Used in hard water softening, pure water manufacturing, hydro-metallurgy, rare elements separation, aminophenol extracting it is widely used in water treatment, sugar manufacturing, pharmacy, monosodium glutamate, hydro-metallurgy industries, etc.
001 × 7FC	-SO ₃ H	Na	≥ 4.5	≥ 1.9	0.45–1.25mm ≥ 95	45.0–50.0	0.77–0.87	≥ 90	Na → H ≤10	(H) 100 (Na) 120	1–14	Used in hard water softening, pure water manufacturing, water softening applications of Floating bed.
001 × 7MB	-SO ₃ H	Na	≥ 4.5	≥ 1.9	0.50–1.25mm ≥ 95	45.0–50.0	0.77–0.87	≥ 90	Na → H ≤10	(H) 100 (Na) 120	1–14	Used in hard water softening, pure water manufacturing, Mixed-bed water treatment system.
001 × 8	-SO ₃ H	Na	≥ 4.5	≥ 2.0	≥ 95	42.0–48.0	0.78–0.88	≥ 95	Na → H 7–9	(H) 100 (Na) 120	1–14	Hard water softening, pure water manufacturing, with good exchange capacity and physical stability. hydrometallurgy, rare element separation.
001 × 10	-SO ₃ H	Na	≥ 4.3	≥ 2.2	≥ 95	38.0–45.0	0.82–0.92	≥ 90	Na → H 3–5	(H) 100 (Na) 120	1–14	Hard Water softening, pure Water manufacturing, Antibiotic extraction and drug purification, etc.
001 × 12	-SO ₃ H	Na	≥ 4.2	≥ 2.3	≥ 95	34.0–42.0	0.82–0.92	≥ 90	Na → H 3–5	(H) 100 (Na) 120	1–14	
001 × 14	-SO ₃ H	Na	≥ 4.0	≥ 2.3	≥ 95	30.0–40.0	0.85–0.95	≥ 90	Na → H 2–4	(H) 100 (Na) 120	1–14	Mainly used in the pharmaceutical industry, antibiotics extraction, antibiotics extraction, etc.
001 × 16	-SO ₃ H	Na	≥ 3.8	≥ 2.4	≥ 95	30.0–40.0	0.85–0.95	≥ 90	Na → H 2–4	(H) 100 (Na) 120	1–14	
SA–2	-SO ₃ H	Na	≥ 4.5	≥ 2.0	≥ 95	42.0–48.0	0.80–0.88	≥ 90	Na → H 6–8	(H) 100 (Na) 120	1–14	Mainly used in the extraction of various amino acids, including lysine, glutamic acid, glutamine, etc.

Styrene Series

Macroporous Strong Acid Cation Exchange Resin

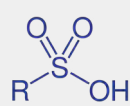


	Functional Groups	Ionic form	Mass exchange capacity	Volume exchange capacity	Particle size range (0.315-1.25mm)	Moisture content	Bulk density (g/ml)	Sphericity after attrition	Reversible swelling	Temperature limit	PH range	Applications
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D001	-SO ₃ H	Na	≥ 4.35	≥ 1.80	≥ 95	45.0–55.0	0.77–0.85	≥ 90	Na → H 9–10	(H) 100 (Na) 120	1–14	Manly used mainly to produce pure water and ultra pure water and purify condensate water, as well as treat waste water and recover precious meta l.
D001FC	-SO ₃ H	Na	≥ 4.35	≥ 1.80	0.45–1.25mm ≥ 95	45.0–55.0	0.77–0.87	≥ 90	Na → H 9–10	(H) 100 (Na) 120	1–14	Pure water manufacturing for floating and bunk bed systems.
D001SC	-SO ₃ H	Na	≥ 4.35	≥ 1.80	0.63–1.25mm ≥ 95	45.0–55.0	0.77–0.87	≥ 90	Na → H 9–10	(H) 100 (Na) 120	1–14	Pure water manucturing and condensate treatment.
D001MB	-SO ₃ H	Na	≥ 4.35	≥ 1.80	0.50–1.25mm ≥ 95	45.0–55.0	0.77–0.87	≥ 90	Na → H 9–10	(H) 100 (Na) 120	1–14	Pure water and condensate treatment in mixed bed system.
D072	-SO ₃ H	Na	≥ 4.4	≥ 1.4	≥ 95	45.0–55.0	0.78–0.86	≥ 95	Na → H 7–9	(H) 100 (Na) 120	1–14	Organic reaction catalysis, high speed mixed bed water treatment, etc.
D061	-SO ₃ H	Na	≥ 4.3	≥ 1.4	≥ 95	44.0–54.0	0.75–0.85	≥ 90	Na → H 6–8	(H) 100 (Na) 120	1–14	Food industry, amino acid extraction, organic reaction catalysis, water treatment, etc.
SXC–9	-SO ₃ H	Na	≥ 4.7	≥ 1.5	0.40–1.25mm ≥ 95	≤10	0.65–0.75	≥ 90	Na → H 8–10	(H) 100 (Na) 120	1–14	Organic reaction catalysis.
D001–CC	-SO ₃ H	Na	≥ 4.2	≥ 2.0	≥ 95	35.0–45.0	0.77–0.87	≥ 90	Na → H 2–4	(H) 100 (Na) 120	1–14	Sugar industry special, sugar juice calcium removal, small expansion rate.

Styrene Series

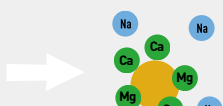
Gel Strong Base Anion Exchange Resin



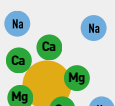
Functional
Groups



Ionic form



Mass
exchange
capacity



Volume
exchange
capacity



Particle
size range
(0.315-1.25mm)



Moisture
content



Bulk
density
(g/ml)



Sphericity
after
attrition



Reversible
swelling



Temperature
limit

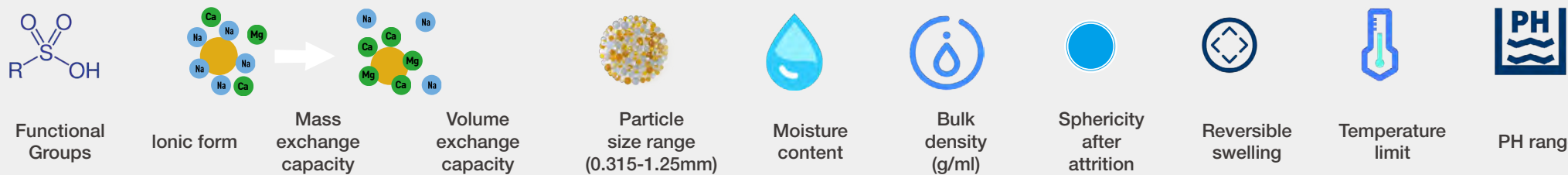


PH range

Applications

201 × 2	-N ⁺ (CH ₃) ₃	Cl	≥ 4.0	≥ 0.75	≥ 95	70–80	0.62–0.70	/	CL → OH 22–55	(OH) 40 (Cl) 100	1–14	It is mainly used in pure water and high purity water manufacturing, sugar solution decolorization, wastewater treatment, extraction of biochemical products and radioelements, etc.
201 × 4	-N ⁺ (CH ₃) ₃	Cl	≥ 3.7	≥ 1.10	≥ 95	50–60	0.66–0.71	≥ 90	CL → OH 25–30	(OH) 40 (Cl) 100	1–14	
201 × 7	-N ⁺ (CH ₃) ₃	Cl	≥ 3.5	≥ 1.35	0.315–1.25mm ≥ 95	42–48	0.67–0.73	≥ 90	CL → OH 18–22	(OH) 40 (Cl) 100	1–14	
201 × 7FC	-N ⁺ (CH ₃) ₃	Cl	≥ 3.5	≥ 1.35	0.45–1.25mm ≥ 95	42–48	0.67–0.73	≥ 90	CL → OH 18–22	(OH) 40 (Cl) 100	1–14	It is mainly used in preparation of pure water and high purity water, extraction and decolorization of biochemical products, wastewater treatment, separation of organic matter, extraction of radioactive elements and extraction of tungsten and molybdenum in hydrometallurgy. 201X7FC is the preferred type of floating bed device. 201X 7MB is the preferred type of mixed bed device. 201X 7SC is the preferred type of bunk bed device.
201 × 7MB	-N ⁺ (CH ₃) ₃	Cl	≥ 3.5	≥ 1.35	0.40–0.9mm ≥ 95	42–48	0.67–0.73	≥ 90	CL → OH 18–22	(OH) 40 (Cl) 100	1–14	
201 × 7SC	-N ⁺ (CH ₃) ₃	Cl	≥ 3.5	≥ 1.3	0.63–1.25mm ≥ 95	42–48	0.66–0.68	≥ 90	CL → OH ≤30	(Cl) 60	1–14	
201 × 7	-N ⁺ (CH ₃) ₃	Cl	≥ 3.5	≥ 1.3	≥ 95	40–48	0.67–0.74	≥ 90	CL → OH 18–22	(OH) 40 (Cl) 100	1–14	Pure water manufacturing, radioactive element extraction, etC.
201 × 8	-N ⁺ (CH ₃) ₃	Cl	≥ 3.4	≥ 1.3	≥ 95	38–46	0.68–0.78	≥ 90	CL → OH 16–20	(OH) 40 (Cl) 100	1–14	High purity water manufacturing, radioactive elements extraction.
HZ202	-N ⁺ (CH ₃) ₃	Cl	≥ 4.1	≥ 0.85	≥ 95	70–80	0.65–0.70	/	CL → OH 30–35	(OH) 40 (Cl) 100	1–14	It is mainly used in extraction and refining of biochemical and pharmaceutical industries, decolorization of extracts and fermentation liquid, adsorption extraction of natural vitamin E, and extraction of antibiotics.
202	N-(CH ₃) ₂ C ₂ H ₄ OH	Cl	≥ 3.5	≥ 1.4	≥ 95	36–46	0.68–0.76	≥ 90	CL → OH ≤15	(OH) 40 (Cl) 60	1–14	Preparation of pure water, especially suitable for high salt content of water sources, separation of biochemical products.

Styrene Series
Gel Macroporous Strong Base Anion Exchange Resin



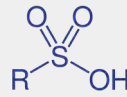
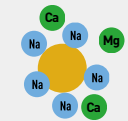
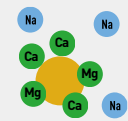

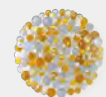






	Functional Groups	Ionic form	Mass exchange capacity	Volume exchange capacity	Particle size range (0.315-1.25mm)	Moisture content	Bulk density (g/ml)	Sphericity after attrition	Reversible swelling	Temperature limit	PH range	Applications
D201	-N ⁺ (CH ₃) ₃	Cl	≥ 3.7	≥ 1.2	≥ 95	50-60	0.65-0.73	≥ 90	CL → OH ≤20	(OH) 40 (Cl) 80	1-14	They are mainly used in manufacture and purification of pure water and high purity water, decolorization of sugar solution and fermentation solution, wastewater treatment, adsorption and extraction of vanadium pentoxide, recycling of heavy metal, etc. D201FC is specially used for floating bed device; D201MB is dedicated for mixing bed devices.
D201FC	-N ⁺ (CH ₃) ₃	Cl	≥ 3.7	≥ 1.2	0.45-1.25mm ≥ 95	50-60	0.65-0.73	≥ 90	CL → OH ≤20	(OH) 40 (Cl) 80	1-14	
D201SC	-N ⁺ (CH ₃) ₃	Cl	≥ 3.7	≥ 1.1	0.63-1.25mm ≥ 95	50-60	0.65-0.73	≥ 90	CL → OH ≤20	(OH) 40 (Cl) 80	1-14	
D201MB	-N ⁺ (CH ₃) ₃	Cl	≥ 3.7	≥ 1.2	0.40-0.90mm ≥ 95	50-60	0.67-0.73	≥ 90	CL → OH ≤20	(OH) 40 (Cl) 80	1-14	
D202	-N-(CH ₃) ₂ C ₂ H ₄ OH ₃ H	Cl	≥ 3.6	≥ 1.2	≥ 95	47-57	0.68-0.74	≥ 90	CL → OH ≤20	≤40	1-14	Pure water manufacturing, D202SC: pure water preparation in bunk bed system, D202FC: pure water preparation in floating bed system.
D202SC	-N-(CH ₃) ₂ C ₂ H ₄ OH ₃ H	Cl	≥ 3.4	≥ 1.15	0.63-1.25mm ≥ 95	47-57	0.68-0.74	≥ 90	CL → OH ≤20	(OH) 40 (Cl) 100	1-14	
D202FC	-N-(CH ₃) ₂ C ₂ H ₄ OH ₃ H	Cl	≥ 3.5	≥ 1.2	0.45-1.25mm ≥ 95	47-57	0.68-0.74	≥ 90	CL → OH ≤20	(OH) 40 (Cl) 100	1-14	
D204	-N ⁺ (CH ₃) ₃	Cl	≥ 3.5	≥ 0.55	≥ 95	70-85	0.60-0.70	≥ 90	CL → OH ≤20	(OH) 60 (Cl) 80	1-14	Mainly used in pharmaceutical industry and intestinal mucosa extraction of heparin sodium, etc.
D290	-N ⁺ (CH ₃) ₃	Cl	≥ 3.4	≥ 0.8	≥ 95	60-70	0.60-0.70	≥ 90	CL → OH 15-18	(OH) 40 (Cl) 100	1-14	Drug extraction and separation, food, sugar industry, etc.
D296	-N ⁺ (CH ₃) ₃	Cl	≥ 3.6	≥ 1.1	≥ 95	50-60	0.65-0.75	≥ 90	CL → OH 18-20	(OH) 40 (Cl) 100	1-14	Water treatment, high-speed mixed bed water treatment, etc.
D280	-N ⁺ C ₅ H ₅ CH ₃	Cl	≥ 3.4	≥ 0.8	≥ 95	58-68	0.68-0.78	≥ 90	CL → OH 15-18	(OH) 50 (Cl) 100	1-14	Organic refining, sugar desalination, etC.
D262	-N ⁺ (CH ₃) ₃	Cl	≥ 2.6	≥ 0.8	≥ 95	45-55	0.68-0.78	≥ 90	CL → OH 8-10	(OH) 40 (Cl) 100	1-14	Remove waste organic matter in lo W concentration in water supply.
D284	-N-(CH ₃) ₂ C ₂ H ₄ OH ₃ H	Cl	≥ 3.4	≥ 1.3	≥ 95	45-55	0.66-0.71	≥ 90	CL → OH 8-10	(OH) 50 (Cl) 100	1-14	Pure water manufacturing.
D201GF	-N ⁺ (CH ₃) ₃	Cl	≥ 4.0	≥ 0.8	≥ 95	60-70	0.66-0.70	≥ 90	CL → OH 12-18	(OH) 40 (Cl) 100	1-14	Used for assimilation of glucose isomerase.

styrene Series Macroporous Weak Base Anion Exchange Resin

D301	-N ⁺ (CH ₃) ₂	Free Base	≥ 4.8	≥ 1.45	0.315-1.25mm ≥ 95	48-58	0.65-0.72	≥ 90	CL → OH ≤28	(OH) 50 (Cl) 100	1-9	It is mainly used in purification, ash removal and decolorization of sugar solution, decolorization of xylose, desalination and decolorization of starch sugar and water treatment industry. When being used in industrial water treatment, it can be used for manufacturing the pure water and high purity water, electroplating the chromium from wastewater, etc. D301-SC and d301-fc were used to prepare pure water and high pure water in the layer bed and floating bed respectively.
D301-SC	-N ⁺ (CH ₃) ₂	Free Base	≥ 4.8	≥ 1.45	0.315-0.63mm ≥ 95	48-58	0.65-0.72	≥ 90	CL → OH ≤28	(OH) 40 (Cl) 100	1-9	
D301-FC	-N ⁺ (CH ₃) ₂	Free Base	≥ 4.8	≥ 1.45	0.450-1.25mm ≥ 95	48-58	0.65-0.72	≥ 90	CL → OH ≤30	(OH) 50 (Cl) 100	1-9	
D301G	-N ⁺ (CH ₃) ₂	OH ⁻	≥ 4.2	≥ 1.3	0.60-1.50mm ≥ 95	50-60	0.65-0.72	≥ 95	CL → OH ≤28	(OH) 40 (Cl) 100	1-9	It is mainly used in hydrometallurgy, extracting the gold from the ore slurry and manufacturing pure water and high purity water.

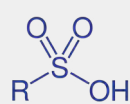
Epoxy Series
And Phenolic Aldehyde Series Ion Exchange Resin



												
	Functional Groups	Ionic form	Mass exchange capacity	Volume exchange capacity	Particle size range (0.315-1.25mm)	Moisture content	Bulk density (g/ml)	Sphericity after attrition	Reversible swelling	Temperature limit	PH range	Applications
330	NH2	Free Base	≥ 9.0	/	10-50mesh ≥ 90	60-70	0.70-0.80	/	OH → CL ≤ 30	(OH) ≤ 100 (Cl) ≤ 40	1-10	Mainly used to remove Cl- and SO2- plasma in water treatment. Purification of citric acid, streptomycin, malic acid and amino acidRemove inorganic acids, extract organic acids and decolorize, Extract copper and silver ions.
122 (II)	-COOH	H	≥ 4.0	≥ 1.0	10-50mesh ≥ 90	60-80	0.70-0.80	/	H → Na ≤ 55	120	5-14	Mainly used to remove Cl- and so2-plasma in water treatment. Purification of citric acid, streptomycin, malic acid and amino acidRemove inorganic acids, extract organic acids and decolorize, Extract copper and silver ions.

Acrylic Acid Series


Gel And Macroporous Weak Acid Cation Exchange Resin



	Functional Groups	Ionic form	Mass exchange capacity	Volume exchange capacity	Particle size range (0.315-1.25mm)	Moisture content	Bulk density (g/ml)	Sphericity after attrition	Reversible swelling	Temperature limit	PH range	Applications
110	-COOH	Na H	≥ 12.0 (H)	≥ 4.0 (H)	≥ 95	52–62 (H)	0.65–0.82 (H)	≥ 70	H → Na 70-75	100	5–14	Water treatment, electroplating and nickel wastewater treatment, pharmaceutical industry, etc.
JK110	-COOH	Na	≥ 12.5 (H)	≥ 4.0 (H)	≥ 95	52–62 (H)	0.75–0.85 (H)	≥ 90	H → Na ≤ 100	100	5–14	Water treatment, electroplating and nickel wastewater treatment, pharmaceutical industry, especially suitable for floating window adsorption streptomycin and other water dealkali softening, desalination.
DK110	-COOH	Na	≥ 8.0 (H)	≥ 3.0 (H)	≥ 95	52–62 (H)	0.70–0.80 (H)	≥ 90	H → Na ≤ 75	100	5–14	Heavy metal recovery, streptomycin, lysozyme extraction and purification, sugar desalination.
724	-COOH	H	≥ 9.5 (H)	≥ 4.1 (H)	≥ 90	45–55	0.70–0.78	≥ 90	H → Na 70	100	5–14	It is mainly used in separation and purification of biochemical products, such as chymotrypsin, CytochromeC, Gentamicin, trypsin, lysozyme, streptomycin and other many biochemical pharmaceuticals.
D113	-COOH	HI	≥ 10.8 (H)	≥ 4.4 (H)	≥ 95	45–52	0.72–0.80	≥ 90	H → Na ≤ 70	100	4–14	Used in the deionization and softening of water and aqueous organic solutions, with 001x7 strongly acidic cation exchange resin can remove alkalinity and hardness from water obviously, especially removing hydrogen carbonates, carbonates and other alkali salts. It is also used in industrial wastewater treatment, metal recycling, separation and purification of biochemical pharmaceuticals etc.
D113FC	-COOH	H	≥ 10.8 (H)	≥ 4.4 (H)	0.450–1.25mm ≥ 95	45–52	0.72–0.80	≥ 90	H → Na ≤ 70	100	4–14	
CD-180	-COOH	Na	≥ 8.0 (H)	≥ 2.2 (H)	0.16–0.42mm ≥ 90	60–70	0.75–0.85	≥ 90	H → Na 75-80	100	4–14	It is used in extraction of amikacin, sisomicin, tobramycin and other aminoglycosides antibiotics.
D151/152	-COOH	Na	≥ 8.0 (H)	≥ 2.0 (H)	≥ 95	60–70	0.70–0.80	≥ 90	H → Na 75-80	100	4–14	Mainly used for the extraction of streptomycin, gentamicin, neomycin and other antibiotics, lysozyme extraction, industrial water softening, desalination, heavy metal wastewater treatment, separation and purification of biochemical products, sugar industry decolorization, ash removal.

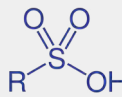
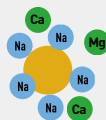

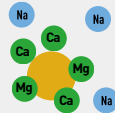





Acrylic Acid Series
Gel And Macroporous Weak Base Anion Exchange Resin



												
	Functional Groups	Ionic form	Mass exchange capacity	Volume exchange capacity	Particle size range (0.315-1.25mm)	Moisture content	Bulk density (g/ml)	Sphericity after attrition	Reversible swelling	Temperature limit	PH range	Applications
312	-N (R2) 2		≥ 5.3	≥ 1.6	≥ 95	56-63	0.66-0.74	≥ 90	OH → Cl ≤28	OH ≤ 100 Cl ≤ 40	1-10	High organic matter, high salt content of water in the preparation of pure water, biochemical pharmaceutical.
D311	-NH2		≥ 7.0	≥ 2.2	≥ 95	55-65	0.70-0.80	≥ 95	OH → Cl ≤25	OH ≤ 100 Cl ≤ 40	1-9	It is mainly used for drug extraction, acid removal and decolorization of sugar solution, water treatment and citric acid extraction.
D315	-NH2		≥ 6.0	≥ 2.0	≥ 95	52-62	0.70-0.80	≥ 95	OH → Cl ≤25	OH ≤ 100 Cl ≤ 40	1-9	Mainly used in drug extraction,Biological fermentation liquid decolorization, sugar liquid decolorization,Citric acid. lactic acid refining, water treatment applications.
D370	-N (CH3)2		≥ 4.4	≥ 1.2	≥ 95	50-60	0.66-0.71	≥ 90	OH → Cl 15-20	OH ≤ 100 Cl ≤ 40	1-9	Water treatment, electroplating containing chromium wastewater treatment, good pollution resistance.
D371	-N (CH3)2		≥ 4.8	≥ 1.4	≥ 95	50-60	0.65-0.75	≥ 95	OH → Cl 8-13	OH ≤ 100 Cl ≤ 40	1-9	
D390	-NH2	Free Base	≥ 4.8	≥ 1.2	≥ 95	60-65	0.70-0.75	≥ 90	OH → Cl 20-25	OH ≤ 100 Cl ≤ 40	1-9 Na+	Pharmaceutical industry, antibiotic extraction and decolorization.
D396	-NH2		≥ 4.5	≥ 1.2	≥ 95	60-70	0.70-0.80	≥ 90	OH → Cl 20-25	OH ≤ 100 Cl ≤ 40	1-9 Na+	
D392	-NH2		≥ 4.5	≥ 1.4	≥ 95	53-58	0.67-0.73	≥ 90	OH → Cl 20-25	OH ≤ 100 Cl ≤ 40	1-9	
D380	-NH2		≥ 4.8	Streptomycin adsorption ≥ 200000 units/ml	≥ 95	50-60	0.65-0.75	≥ 90	OH → Cl 40-60	OH ≤ 100 Cl ≤ 40	1-9	Streptomycin extraction, citric acid and other organic acid decolorization.
D382	-NHCH3		≥ 6.5	≥ 1.2	≥ 95	40-50	0.66-0.70	≥ 90	OH → Cl 17-19	OH ≤ 100 Cl ≤ 40	1-7	Weak acid retfining, strong separation of weak acid.
D341	-NH2		≥ 3.5	≥ 2.0	≥ 95	55-65	0.70-0.80	≥ 95	OH → Cl ≤25	OH ≤ 100 Cl ≤ 40	1-9	It is mainly used for decolorization and purification of sugar and other food industry, stevia, ginseng saponin, panax notoginseng saponin, antibiotics and other natural medicines.

Regenerable And Non Regenerable Mixed Bed Resin



										
	Functional Groups	Ionic form	Volume exchange capacity	Moisture content	Bulk density (g/ml)	Particle size range	Temperature limit	PH range	Applications	
MB330	001 × 7H: 50% 201 × 7OH: 50%	Cation: ≥ 99% H Anion: ≥ 90% OH	H: 1.9 OH: 1.0	50–60	0.72–0.76	0.315–1.25mm ≥ 95	(OH) ≤ 100 (Cl) ≤ 40	1–14	Used for the preparation of deionized water and ultra-pure water.	
MB400	001 × 7H: 50% 201 × 7OH: 50%	Cation: ≥ 99% H Anion: ≥ 90% OH	H: 1.9 OH: 1.0	50–60	0.71–0.74	0.315–1.25mm ≥ 95	(OH) ≤ 100 (Cl) ≤ 40	1–14	Used for the preparation of deionized water and ultra-pure water.	

The conductivity of the above mixed bed are all less than 0.1μs, the resistivity can reach 10 megohms, 15megohms and 18 megohms.




The cation exchange resin can be made into a dark color (close to black), so the Cation resin and Anion resin can be more easily separated when the resin is regenerated.

Food Grade Ion Exchange Resin

	Functional Groups	Ionic form	Mass exchange capacity	Volume exchange capacity	Particle size range (0.315-1.25mm)	Moisture content	Bulk density (g/ml)	Sphericity after attrition	Initial PH	Colour through (APHA)	Reversible swelling	Temperature limit	PH range	Applications
001 × 4	-SO ₃ H	Na	≥ 4.5	≥ 1.3	≥ 95	55–65	0.74–0.84	≥ 95	7.0–10.0	≤50	Na → H 22-25	H 100 Na 120	1–14	Hard water softening, pure water r manufacturing, with good exchange capacity and physical stability.
001 × 7	-SO ₃ H	Na	≥ 4.5	≥ 1.9	≥ 95	45–50	0.77–0.87	≥ 95	7.0–10.0	≤50	Na → H ≤ 10	H 100 Na 120	1–14	
001 × 8	-SO ₃ H	Na	≥ 4.5	≥ 2.0	≥ 95	42–48	0.78–0.88	≥ 95	7.0–10.0	≤50	Na → H 7-9	H 100 Na 120	1–14	
001 × 10	-SO ₃ H	Na	≥ 4.2	≥ 2.2	≥ 95	38–45	0.82–0.92	≥ 95	7.0–10.0	≤50	Na → H 3-5	H 100 Na 120	1–14	
D113	-COOH	H	≥ 10.8	≥ 4.4	≥ 95	45–52	0.72–0.80	≥ 95	/	/	Na → H ≤ 70	H 100 Na 120	4–14	use in the deionization and softening of water and aqueous organic solutions,with 001x7 strongly acidic cation exchange resin can remove alkalinity and hardness from water obviously,especially removing hydrogen carbonates, carbonates and other alkali salts.

Chelation Resin



												
	Functional Groups	Ionic form	Mass exchange capacity	Volume exchange capacity	Particle size range (0.315-1.25mm)	Moisture content	Bulk density (g/ml)	Sphericity after attrition	Reversible swelling	Temperature limit	PH range	Applications
S400	Imine diacetoxyl	Na	≥ 2.00 (Cu ²⁺)	≥ 0.6 (Cu ²⁺)	≥ 95	52-58	0.71-0.77	≥ 90	Na → H < 40	80	1-14	
S500	Imine diacetoxyl	Na	≥ 2.00 (Cu ²⁺)	≥ 0.6 (Cu ²⁺)	≥ 95	52-58	0.71-0.77	≥ 90	Na → H < 40	80	1-14	This product can fix and chelating one or several kinds certain cation in a great range even in the solution with high content. It is used mainly to separate and recover the precious metals ion
S600	Azylphosphonate (-CH2NHCH2PO3-)	Na	/	≥ 1.2	0.45-1.00mm ≥ 95	52-62	0.71-0.77	≥ 90	Na → H < 45	80	1-14	
S700	Thioureido	Cl	/	≥ 1.10	≥ 90	50-60	0.68-0.75	≥ 90	/	80	1-14	It is mainly used for the separation and purification of precious metal ions.

Macroporous Adsorption Resin



	Relative surface area (m ² /g)	average pore size (nm)	Particle size range (0.315-1.25mm)	Moisture content	Bulk density (g/ml)	Temperature limit	appearance	molecular polarity	Applications
YPR-II	520-570	9-10	≥ 95	45-55	0.67-0.73	120	Milk white (Dry) Translucence (Wet)	Non-polar	It is used for the adsorption of abamecia, ivermectia, erythromycin and its series of products, extraction and separation of ginkgo, antibiotics, Chinese herbal medicine, plasma separation and purification, preparation of stationary phase for the enrichment of trace elements, organic wastewater treatment and so on.
D1300	460-500	9-10	≥ 95	≤ 70	0.65-0.75	120			Anti-cardiovascular and cerebrovascular, anti-tumor drugs and a variety of Chinese herbal medicine extraction and decolorization, the extraction of natural products.Treating non-polar organic compounds in industrial wastewater, such as papermaking wastewater and pesticide wastewater.
D1400	460-500	9-10	≥ 95	≤ 70	0.65-0.75	120			Adsorption and extraction of vitamin B12 and many other antibiotics. Extraction of natural products and treatment of non-polar organic compounds in industrial wastewater, such as papermaking wastewater and pesticide wastewater.
D101	550-650	9-10	≥ 95	65-75	0.65-0.75	120	Milky white opaque globular granules		Extraction and refinement of natural drugs such as ginsenosides, panax notoginseng saponins, double twist, ginkgo flavones, tea polyphenols, soybean isoflavones, puerarin, glycyrrhizin and chlorophyll.
D101-1	600-700	9-10	≥ 95	65-75	0.65-0.75	120			It is mainly used in the extraction and refinement of natural drugs such as ginsenosides, notoginseng saponins, yam saponins, dioscorea, ginkgo flavone, tea polyphenols, soybean isoflavones, puerarin, glycyrrhizin and chlorophyll.
X-5	500-600	28-30	≥ 95	53-63	0.61-0.71	120			Mainly used for antibiotics, pigment extraction, Chinese herbal medicine separation and extraction, organic wastewater, uremia patients blood removal of molecular substances, etc.
D3520	480-520	8-9	≥ 95	70-80	0.60-0.70	120			Protein extraction, decolorization, desalination, etc.
NKA	550-600	20-22	≥ 95	62-72	0.61-0.71	120			Mainly used for saponin extraction and so on.
H103	900-1100	8-10	≥ 95	45-55	0.70-0.75	120	Brown to brown opaque globular particles	Weak polarity	Mainly used for the extraction and separation of antibiotics, organic wastewater, removal of phenols, oxides, pesticides and so on. Adsorption and recovery of organic compounds containing benzene, chlorobenzene, phenol, aniline, salicylic acid, naphthalene sulfonol in wastewater.
AB-8	480-520	13-14	≥ 95	60-70	0.62-0.72	120	Milky white opaque globular granules		It is most suitable for the extraction, separation and purification of water-soluble and weakly polar substances, such as ginkgo flavone adsorption extraction, natural pigment extraction, stevia sugar extraction, alkaloid extraction, etc. It has good adsorption effect on cephalosporin, ivermectin and clocomycin phosphoric acid.
CAD-40	460-500	7-8	≥ 95	60-70	0.67-0.73	120			Used for the adsorption and extraction of vitamin B12 and other antibiotics.
SAD-1	650-750	10-12	≥ 95	60-70	0.63-0.73	120			Juice decolorization, bitterness removal, etc.
DM130	500-550	9-10	≥ 95	65-75	0.67-0.73	120			It is mainly used to extract and refine ginkgo flavone, ginsenosides, panax notoginseng saponins, soybean isoflavones, tea polyphenols and other natural medicines.
DM301	330-380	13-17	≥ 95	65-75	0.62-0.72	120			Mid- polar
ADS-17	90-150	25-30	≥ 95	52-62	0.65-0.75	120	Ginkgo flavone adsorption extraction, seabuckthorn leaf flavone adsorption extraction, camptothecin extraction and separation.		



	Relative surface area (m ² /g)	average pore size (nm)	Particle size range (0.315-1.25mm)	Moisture content	Bulk density (g/ml)	Temperature limit	appearance	molecular polarity	Applications
NKA-II	160-200	14-16	≥ 95	42-52	0.67–0.75	120	Reddish-brown opaqueglobular granules	Polarity	Removal of phenols and organic compounds.
NKA-9	250-290	13-17	≥ 95	65-75	0.65-0.72	120	Reddish-brown opaque globular granules	Polarity	For bilirubin removal, alkaloid separation, flavonoids extraction, etc.
S-8	100-120	28-30	≥ 95	66-72	0.60-0.70	120	Milky yellow opaque globular granules	Polarity	Used for antibiotics, Chinese herbal medicine extraction and separation, plasma separation and purification, preparation of stationary phase for enrichment of trace elements, organic wastewater treatment, etc.
D101	150-200	23-25	≥ 95	65-75	0.62-0.72	120	Milky white opaque globular granules	Molecular polarity	The extraction of fitllary fitllary and compound medicine, as well as the treatment of waste water and liquid in chemical and pharmaceutical industry, the recovery and purification of chemical products have good effects.
D101-1	800-900	12-14	≥ 95	60-70	0.62-0.72	120		Polarity	It is mainly used for the extraction and separation of antibiotics, Chinese herbs and pigments, and the preparation of fixed phase for the enrichment of trace elements.

Macroporous adsorption resin specification standards, residue limits, safety in strict accordance with the national drug evaluation center ” macroporous adsorption resin separation and purification of traditional Chinese medicine extraction” requirements, styrene skeleton macroporous adsorption resin residue: benzene < 2ppm, toluene < 890ppm, dimethyl < 2170ppm.

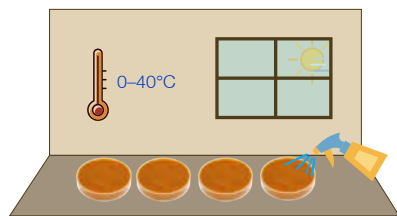
The total residue of styrene, alkane, diethyl benzene and resin is lower than :

the national standard or the international standard. The safety of non – benzofenyl matrix macroporous adsorbents should be increased in animal experiments.It is suggested that the specific column amount, specific adsorptionamount, specific elution amount, retention rate and purity should be used to evaluate the purification effect of adsorption resin, so as to prevent the leakage of effective ingredients.In general, the purification of the same drug macroporous resin, its adsorption capacity decreased to less than 30%, the resin should not be reused.

INSTRUCTIONS FOR USE OF RESIN

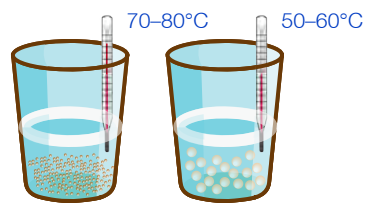
Instructions For Use Of Ion Exchange Resin

Resin Storage



Ion exchange resins should not be stored in the open air, and the storage temperature should fall between 0–40 °C. When the storage temperature is slightly below 0 °C, clarified saturated salt water should be added to the bag to soak the resin. In addition, when the storage temperature is too high, it will not only make the resin easy to dehydrate, but also accelerate the degradation of anion resins. Once the resin loses moisture, it cannot be added with water directly, but soaked in clarified saturated salt water, and then gradually diluted with water to wash away the salt. Resins should be kept moist during storage.

Resin Pretreatment



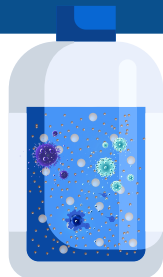
The new resin for column loading should be washed repeatedly with hot water (clean tap water). Cation exchange resin can be washed repeatedly with hot water of 70–80 °C. The heat resistance of anion exchange resin is not so strong, and hot water of 50–60 °C can be used. At the beginning of the immersion, change the water every 15 minutes or so. When it is washed, it should be stirred from time to time. After changing the water for 4–5 times, it can be washed for about 30 minutes to change the water once. The total water should be changed for 7–8 times. Immerse the resin until the outlet water is limpid without water or with few bubbles.

After washing and , the cation exchange resin can be treated with acid and alkali according to the following steps:

- ① Process the resin with 1N hydrochloric acid to make it flow through the resin slowly. The dosage is 2–3 BV and the flow rate is 1.5 BV/hr.
- ② Wash with raw water until the PH value over 5. Process the resin with 5% NaCl solution that is 3 times of resin volume to flow through the resin, and the flow rate is 1.5 BV/hr.
- ③ Wash the resin with 1N NaOH, and the flow rate is 1.5 BV/hr.
- ④ Wash with raw water until the PH value under 9.
- ⑤ Process the resin with 1N hydrochloric acid or sulfuric acid to turn the resin into H type. The dosage is 3–5 BV and the flow rate is 1.5 BV/hr.
- ⑥ After the acid treatment, wash with deionized water until the PH value over 6, and then put it into use.

In terms of the acid and alkali treatment sequence after anion exchange resin washing, the sequence of alkali → acid → alkali can be used. In terms of the acid and alkali dosage and flow rate, strong base resin correspond to strong acid resin, weak base resin corresponds to weak acid resin.

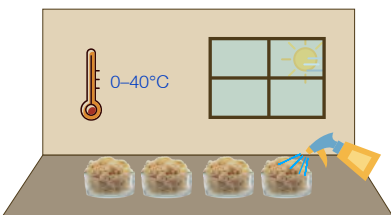
Resin Regeneration



During the use of ion exchange resin, after a period of service, the effluent quality and exchange capacity tend to decrease gradually. This is generally caused by the contamination of the resin during operation. In wastewater and biochemical refining, the resin is more likely to be contaminated because of the complex composition. Therefore, appropriate measures must be taken to regenerate the resin. Different regeneration treatment processes are used for different conditions. We can provide technical guidance according to your specific conditions.

Instructions For Use Of Macroporous Adsorption Resin

Resin Storage

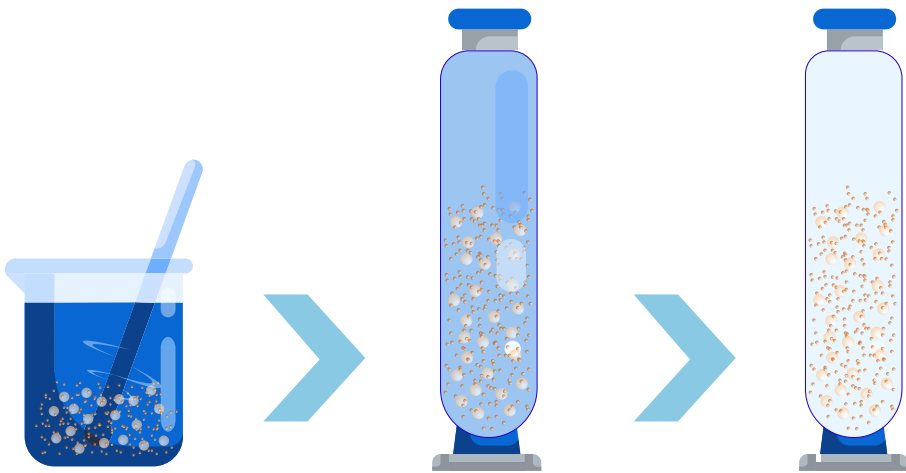


Absorbent resin is generally stored in wet conditions, and the storage temperature should fall between 0–40 °C. When the storage temperature is slightly below 0 °C, clarified saturated salt water should be added to the bag to soak the resin. If exposed to the air, the resin may lose moisture. Since most of the adsorption resins are hydrophobic, in order to rehydrate the resins, the partially dehydrated adsorption resins should be placed in methanol or other water-soluble solvents (e.g., ethanol, acetone) for full immersion. And then wash with water to replace the methanol after full immersion.

Resin Pretreatment

Absorbent resin pretreatment methods are as follows:

- ① Process the new resin with 2 BV of ethanol or other water-soluble solvents (e.g., ethanol, acetone) and immerse the resin for 2 hours, and then stir the resin from time to time to make the resin fully swollen.
- ② Load the fully swollen resin into the column. Process the resin with 5–8 times of ethanol or other water-soluble solvents (e.g., ethanol, acetone) and make it flow through the resin layer at a flow rate of 3–4 BV/hr until the outlet water is clear after diluted with water.
- ③ After the ethanol treatment, process with resin with deionized water and make it flow through the resin layer at a flow rate of 6–8 BV/hr. Replace the ethanol and then the resin can be put into use.





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