LIJIRESIN
ION EXCHANGE RESIN

HEBEI LIJIANG BIOTECHNOLOGY CO.,LTD.

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LIJIRESIN
ION EXCHANGE RESIN

Catalog

1 Company Profile

Hebei Lijiang Biotechnology Co., Ltd. is a new material manufacturer specializing in the production of high-performance special ion exchange resins. It is a modern high-tech enterprise that integrates the research and development, production, sales, and service of resin materials and resin terminal products. The company is committed to producing high-quality industrial grade, food grade, pharmaceutical grade, and nuclear grade resins. It has passed ISO9001 management certification, SGS certification, and WQA international certification from the American Water Quality Association, and has obtained a national food hygiene license. Food grade resin products comply with FDA standards in the United States.

Hebei Lijiang Biotechnology Co., Ltd. will take leading technological reform and innovation, serving market demand as its purpose, winning customer satisfaction as the standard, and integrity and win-win as the concept, continuously exploring product connotation and improving product quality. Our company is willing to work together with people from all walks of life to create brilliance.

Relying on our company's strong scientific research capabilities, we can customize specialized resins that meet special needs for customers and provide point-to-point solutions. The product has a wide range of applications, mainly including: water pollution control, high-purity water treatment, traditional Chinese and Western medicine extraction, biopharmaceutical, blood perfusion, new agricultural planting, new material nano coating, rare and precious metal extraction, etc.

Hebei Lijiang Biotechnology Co.,Ltd R&D Center is equipped with a testing center, inspection center, resin synthesis center, application center, and multiple laboratories. Under the leadership of Professor Shi Zuoqing, a domestic resin industry research expert, the core team has attracted multiple top domestic and foreign talents, as well as several expert professors. Relying on multiple higher education institutions to establish research and development sharing platforms, the team is positioned at the forefront of science and technology to achieve innovation and practice of new materials in fields such as medicine, nuclear power, and agriculture.

Production Workshop

Hebei Lijiang Biotechnology Co., Ltd. is a new material manufacturer centered on the production of special ion exchange resins. It is a modern high-tech enterprise that integrates the research and development, production, sales, and service of resin materials and resin terminal products.

The factory covers an area of 269 acres, with a total initial investment of 600 million yuan and an estimated annual output value of 650 million yuan.

3 Product Application

Ion exchange resin products are widely used in various fields, including water softening, water treatment in the food industry, high-purity water preparation, traditional Chinese and Western medicine extraction, synthetic chemistry and petrochemical industries, blood perfusion, amino acid extraction, and purification of rare and precious metals in hydrometallurgy.

Water Treatment

Mainly used for the removal of various anions and cations in water, water softening, high-temperature condensation water in power plants, semiconductors, electronics industry, high-purity water in nuclear power plants, sewage treatment, and other fields.

Pharmaceutical Industry

Mainly used in fields such as saponins, flavonoids, alkaloids, pigments, antibiotics, and traditional Chinese medicine extraction.

Ion exchange resin in pharmaceutical industry plays an important role in developing new generation of antibiotic and improving the quality of original antibiotic.

Food Industry

Mainly used in household drinking water, filter pots, household water softeners, and filter cartridges.

It can be used in industrial devices such as refining sugar, monosodium glutamate, wine, and biological products.

Hydrometallurgy

Mainly used for gold and uranium separation, concentration, purification, extraction of rare earth elements and precious metals.

Synthetic Chemistry and Petrochemical Industry

Mainly used in catalytic reactions such as the preparation, alkylation, and hydration of isobutene of methyl tert butyl ether (MTBE).

Acid and alkali catalysts are commonly used in organic synthesis.

In organic synthesis, acids and bases are often used as catalysts for esterification, hydrolysis, transesterification, hydration and other reactions.

Blood Perfusion

Mainly used for the treatment of uremia, drug poisoning, lupus erythematosus, and various critically ill patients.

4 Product Center

Ion Exchange Resin

Industrial grade： produced strictly according to national standards, and must be treated according to pre-treatment methods before being put into use.
Food grade： After strict production process, it can be directly applied to the food industry.
Nuclear level： Strictly pretreated according to special processes, it can be directly used in nuclear power plants.

Macroporous Adsorption Resin

Industrial grade： produced strictly according to national standards, and must be treated according to pre-treatment methods before being put into use.
Premium grade： After simple pre-treatment, industrial products can be directly used.
Net grade (pharmaceutical grade)： After special processing, it can be directly applied to the pharmaceutical industry.

Resin Particle Size

Conventional particle size： overall range is 16x50 mesh
Big ball series： overall range is 10x20 mesh
Small ball series： overall range is 30x60 mesh
Microsphere series： overall range is 100x400 mesh
Uniform Ball Series： The overall range is around 28 mesh

Strong Acid Cation Exchange Resins

Normal Resin : cross-linking 7% and 8%, mainly used for water treatment, water softening, and desalination.
Medium high cross-linked gel resin: cross-linking 10-16%, high strength, mainly used in the extraction of various antibiotics.

Model	Main Application
001×2	Extraction of macromolecular antibiotic, pharmaceutical and chemical industry, etc.
001×4	Designed especially for small scale domestic softening. Potable water grade.
001×7	Softening and demineralization resin,widely used in industrial and domestic applications. Potable water grade.
001×8	Primary softening and demineralizationresin.
001×10	Excellent resistance to oxidation. Higherdensity cation resin offering good separation from anion resins in mixed bedapplications and weak acid cation resins inlayered beds.
001×12	Desalination, antibiotic extraction.
001×16	
D001	Macroporous structure offers high resistance to OSA. Employed in areas of very difficult operating conditions such ascondensate treatment and processapplications.
D002	Pharmaceutical separation
001NS	Solvent-free resin

Weak Acid Cation Exchange Resins

Gel weak acid: desalting, drug extraction.
Macroporous weak acid: water treatment, desalination.

Model	Main Application
D113	High capacity regenerable dealkalization resin with good exchange kinetics.
118	Dealkalization, softening, and desalination treatment of industrial water. Heavy metal wastewater treatment, recovery of nickel, cobalt, copper, zinc, cadmium, etc.Acid alkali wastewater treatment. Recycle useful substances from wastewater containing chlorine (amine) and other substances. It is used for the extraction and purification of streptomycin, cytochrome C, urokinase and lysomycin. Used for desalination of sugar solution in the sugar industry.
D152	Higher resistance to OSA. For process applications, such as antibiotics extraction from fermentation broths and treatment of ammoniacal condensates.
CD180	Used for extracting and separating aminoglycoside antibiotics such as amikacin, sisomicin, and tobramycin.
122	Phenolic resin, used for decolorization.
D115	Very weakly acidic for process applications especially in the pharmaceutical industry.Recommended for the "CARIX" process.

Strong Base Anion Exchange Resins

Low cross-linked gel anion resin: cross-linking 1-4%, mainly used for the extraction of various antibiotics and the adsorption of organic acids.
Normal resin: cross-linking 5% and 7%, mainly used for water treatment, water softening, and desalination.
Macroporous styrene resin: mainly used for desalination and decolorization of water.
Acrylic resin: High pollution resistance, mainly used for decolorization in the sugar industry.

Model	Main Application
201×2	Antibiotic refining, etc.
201×4	Water treatment and wastewater treatment, recovery of precious metals, purification and separation of antibiotic.
201×7	Premium grade resin with high total capacity and high breaking weight. Very low sllica leakage.
201×8	Mainly used for pure water preparation, wastewater treatment, biochemical products, and extraction of tungsten and molybdenum in hydrometallurgy.
202	Premium grade high capacity resin offering good silica removal. Primarily used in the production of demineralized and dealkalized water.
213	Most widely used resin for the demineralization of high organio bearing waters, offering the best resistance to organic fouling. Higher operating capacity than type l polystyrenic resins, while still offering very good silica leakage in co-flow and counter-flow regeneration.
D201	Mainly used for the preparation and coagulation purification of pure and high-purity water, as well as for wastewater treatment and heavy metal recovery.
D202	Macroporous version of 202×4 offering better resistance to OSA and organic fouling due to its polymer structure.
D213	Acrylic based organic scavenger resin used to reduce NOM (Natural Organic Matter) color levels and fouling of downstream anion resins. Also supplied as D213 for potable water and food applications. Better suited to brine-only regeneration than D380.
D219	Organic cleaning agent, desalination, and removal of silicic acid blockage.
D220	Special resin for nitrate removal
D230	Remove perchlorate specific resins, polyfluoroalkane based substances (PFAS).

Weak Base Anion Exchange Resins

Tertiary amine anion resin: water treatment, desalination and decolorization, hydrometallurgical extraction of gold and silver, electroplating wastewater treatment.
Primary amine resin: extracted by Streptomycin.
Acrylic anion resin: mainly used for desalination and decolorization of citric acid and sugars.

Model	Main Application
D301	Most widely used WBA in IWT due to its good resistance to organic fouling and high operating capacity.
D301G	Hydrometallurgy, extracting gold from ore slurry.
D370	Water treatment, electroplating chromium containing wastewater treatment, good pollution resistance.
310	Mainly used for drug extraction, sugar removal and decolorization, water treatment, and citric acid extraction.
D311	Very high exchange capacity polyamine resin developed for special applications such as desulphatation of seawater.
D941	Mainly used for decolorization of citric acid, stevia sugar, and vitamin C, widely used in the food industry.
330	It is mainly used for removing inorganic acid and extracting in the refining of citric acid, streptomycin, malic acid, amino acid, etc.Organic acids and decolorization, removal of Cl - and SO2- plasma in water treatment, and recovery of copper and silver ions.
D380	Macroporous version of 201×5 offering greater resistance to OSA. Mainly used in condensate polishing or make-up mixed beds, where its polymer structure helps in resisting organic fouling.

Adsorption Resins

- Special adsorption resin for blood perfusion
- Phenol containing wastewater adsorption resin
- Antibiotic extraction adsorption resin
- Fruit juice decolorization adsorption resin
- Adsorption resins for natural extraction
- Organic wastewater adsorption resin

Model	Main Application
D101	Broad spectrum adsorption resin. Suitable for adsorption of various saponins, flavonoids, etc. Used for Stevia adsorption.
AB-8	
AD101	Broad spectrum adsorption resin. Suitable for adsorption of various saponins, flavonoids, etc. Used for Stevia adsorption.
AD-8	
H103	Ginkgo biloba extrac
DM130	Ginkgo biloba extrac
X-5	Antibiotics and Chinese herbal medicine were isolated and extracted. Organic wastewater treatment. Preparation of stationary phase, enrichment of trace elements, removal of medium molecular substances from blood of uremic patients, etc.
AD300	Antibiotics were extracted and separated to remove phenols, chlorides, pesticides, etc.
AD4	Removal and recovery of volatile substances, wastewater treatment of small molecule (< 200D) pollutants.
AD16	General purpose resin, recovery and purification of medium molecular (< 1000D) substances, water-soluble steroids, natural product enzymes, amino acids and proteins, and wastewater treatment of medium molecular pollutants.
AD18	Recovery and purification of general medium molecular substances, natural products, water-soluble steroids, enzymes, amino acids and proteins.
AD20	Remove high-grade fatty acids and turbidity in wine.

Catalytic Resins

Organic reaction catalytic resin: mainly used for MTBE production.
Dry catalytic resin: solid acid, mainly used for anhydrous catalytic reaction.
High temperature resistant catalytic resin: a catalyst mainly used for hydration of olefins to prepare fatty alcohols.

Model	Main Application
CA1500D	Biodiesel purification
CA1220	Bisphenol A
CA1500	Ether catalysis
CA1600	Alkylation
CA1700	Excellent accessibility of active sites. Studied and developed for the synthesis of MTBE, ETBE and TAME.
CA2700	MTBE

Chelating Resins

Amino phosphoric acid type resin: Ion exchange membrane caustic soda, preparation of secondary brine, hydrometallurgy, etc.
Iminodiacetic acid resin: it has high selectivity for multivalent metal ions and is used for the separation and purification of metals.
Thiourea resin: used for the adsorption of precious metal ions.
Amidoxime type resin: a special resin for adsorbing gallium in aluminum ore solution.

Model	Main Application
CH500	For base metals recovery from weak acid solutions.Suitable for RIP process. 800-1300 μm grading.
CH510	Highly selective for low atomic weight metals. Also used in purification of brine where lower strontium levels are encountered in chlor-alkali plants.
CH520	Selective removal of boron from potable water and water used inagriculture/ horticulture irrigation.
CH530	High selectivity and high capacity for mercury removal in wastewaters. Widely used for final polishing to meet mercury discharge limits. Selectiveremoval of precious metals(gold, platinum, palladium, etc) from acidicsolutions. Non-regenerable use.
CH540	Arsenic removal
CH550	Gallium extraction
CH560	Defluorination
CH570	CO2 and aldehyde adsorption，acid and color removal

Mixed Bed Resins

Mixed bed resin: used to reduce the hardness, alkalinity, and anions and cations in water, turning it into softened water and deionized water. It has extremely high regeneration efficiency, extremely low impurity content, strong exchange ability, and high mechanical strength. It can be widely used in the preparation of high-purity water in the electronic industry; Laboratory high-purity water; High purity water for high-performance liquid chromatography; Radioactive material handling; Medicines; Semiconductor industry; Terminal mixed bed for condensate refining and various other water treatment processes.

Model	Main Application
MX900	For the production of high-purity, silica-free demineralized water. Principal use inpolishing units after small iEX or RO plants. Also used in direct treatment of rawwaters. High operating capacity, achieving conductivities less than 0.1μS/cm inmany polishing applications. MB400 is the most popular ready to use industrial grade mixed bed.
MX900IND	Discoloration mixed bed
MX910	Wire cutting, slow wire walking.
MX990	Nuclear grade resin, nuclear power plant.

Hydrometallurgy Resins

Higher extraction efficiency and economy. It can adsorb and enrich metal ions from dilute solutions, and has different selectivity for mixed metal ions, making it particularly suitable for extracting and separating metals from ore slurry. At the same time, it plays a crucial role in separating metals with similar performance. Advantages: The total recovery of valuable metals in raw materials is high, which is beneficial for environmental protection.

Model	Main Application
D301G	Adsorption of gold in hydrometallurgy industry
D311	Very high exchange capacity polyamine resindeveloped for special applications such asdesulphatation of seawater.
CH530	High selectivity and high capacity for mercury removal in wastewaters. Widely used for final polishing to meet mercury discharge limits. Selectiveremoval of precious metals(gold, platinum, palladium, etc) from acidicsolutions. Non-regenerable use.
CH550	Gallium extraction
D201U	Uranium extraction
201W	Tungsten extraction

Special Resins

Resin synthesized by a special process with unique chemical structure and properties. Suitable for specific industries, specific water quality, and selective removal of target extracts. It has ultra-high exchange capacity and high stability for the target extract.

Model	Main Application
Chromatographic cation resin	50 mesh -100 mesh, 100 mesh -200 mesh, 200 mesh -400 mesh. Medication Separation.
Chromatographic anion resin	50 mesh -100 mesh, 80 mesh -120 mesh. Medication Separation.
OIL100	Oil water separation, emulsified oil separation.
Amphoteric resin	Strong acid and strong base type, metal ion separation.
WB100	Used to provide mechanical lubrication, reduce torque and resistance, prevent casing wear.
IND01	Cation resin with indicator
IND02	
IND21	Anion resin with indicator

Comparison Table of LIJI RESIN and Other Brand

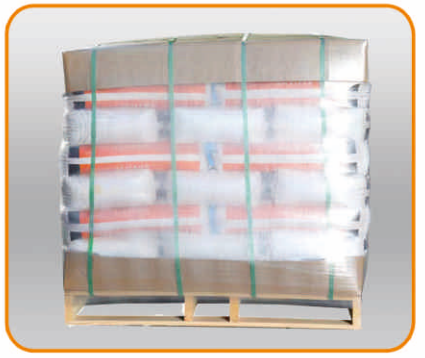
LIJI RESIN	ROHM&HAAS			DOW DOWEX	PUROLITE	MITSUBISHI DIAION	BAYER LEWATIT	SYBRON	RESINTECH
	AMBERLITE	AMBERJET	DUOLITE						
STRONG ACID CATION RESINS									
001×4	IR118				C120E				
001×7 001×7 BK	IR120		C-20	HCR-S/S/FF	C100E		S100LF		CGS CGS-BL
001×8 001×8 BK	IR120		C-20	HCR-S	C100	SK1B	S100	C-249	CG8 CG8-BL
001×8 H 001×8 H-BK					C100H				CG8-H CG8-H-BL
001×7IND									
001×7NS									
001×8NS									
001×8 C					C100C				
001×8 MB					C100MB				CG8-C
001×8 F									CG8-F
001×8 UN		1000Na 1000H		MARATHON C					CG8-UPS
001×10 001×10 BK	IR122	1300Na 1300H	C-20x10	HGR-W2	C100×10	SK110	S110	C-250	CG10
001×12 001×12 BK				HGR	C100×12				
D001	IR252 AMB252		C-26S	MSC-1/C(H)	C150	PK216-228	SP112-120	CFP-110 C-360	SACMP
WEAK ACID CATION RESINS									
D113	IRC76 / 86		WK-40/20	MAC-3	C104	MWC-1	CNP-80 CNP	CCP	WACG
D113 Na									
D113FG H					C107E				
D113 K									
118					C105				
D152					C106				
CD 180									
122									
D115					C115				
STRONG BASE ANION RESINS									
201×5	IRA402	4200 4200Cl	A-113	SBR-P	A400	SA 12A	M500	ASB-1P	SBG1P
201×7	IRA400		A-109	SBR	A600	SA 10A	M500/611	ASB-1	SBG1

Comparison Table of LIJI RESIN and Other Brand

LIJI RESIN	ROHM&HAAS			DOW DOWEX	PUROLITE	MITSUBISHI DIAION	BAYER LEWATIT	SYBRON	RESINTECH
	AMBERLITE	AMBERJET	DUOLITE						
STRONG BASE ANION RESINS									
202×4	IRA410	4600Cl	A102	SAR	A200	SA 20A	M600	ASB-2	SBG2
202			A104	SAR	A300	SA 20A	M610	ASB-2	SBG2
213	IRA458				A850		VP OC1071	A475	SBACR1
D201	IRA900		A-161	MSA-1 C	A500	PA308/312	MP500	A641	SBMP1
D202	IRA910		A-162	MSA-2/22	A510	PA412/416	MP600	A651	
D213	IRA958				A860		VP OC1074	MACRO-T	
D380					A500P				
D219									
D220					A520E				
D230					A530E				
WEAK BASE ANION RESINS									
D301	IRA93			MWA-1	A100	WA-30	MP62-64		WEMP
D301H	IRA92			M-43	A103				
310	IRA66/67			66	A845	WA-11	VP OC1072		
312					A847				
D311	IRA60				A830		AP49	A375	
MIXED BED RESINS									
MX900	MB20/MB9			MB/MB-50 MR-3	Mb400 Mb46				
MX900IND					Mb400 MB461ND				
SPECIAL RESINS									
CA1700	A35			M-31	CT175		K1221 2641-49		
D21P					A500P	HPA25	S6328A		SIR-22P
CH500	IRC748			XZ95843	S930	CR11	TP207/208	SR-5	SIR-300
CH510	IRC747		C467	XZ87480	S940		TP260		SIR-500
CH530	GT73			XZ95844	S920		TP214	SR-4/3	SIR-200/400
CH520					S108			S-3	
AD-4	XAD4				AP250				
AD-16	XAD16								
AD-18	XAD1800								

5 Packing & Transportation

Transportation



Packing

6 Factory Image

WQA,SGS,TÜV,HALAL


Water Quality Association
Gold Seal Certificate
Hebei Lijiang Biotechnology Co., LTD
No.2 East Construction Road, Circular Economy Industrial Park, Weixian
Xinghe, Hebei China
Facility: Hebei Lijiang Biotechnology Co., LTD


Gold Plus Supplier Assessment Certificate
Verified
Hebei Lijiang Biotechnology Co., Ltd.


HALAL CERTIFICATE
Hebei Lijiang Biotechnology Co.,Ltd.
NO. 0010682


Water Quality Association Official Gold Seal Listing


AUDITED SUPPLIER
Hebei Lijiang Biotechnology Co., Ltd.
河北利江生物科技有限公司

Management System Certification


COPY
QUALITY MANAGEMENT SYSTEM
CERTIFICATE OF REGISTRATION
Hebei Lijiang Biotechnology Co.,Ltd.
GB/T19001-2016/ISO9001:2015
Production of cation exchange resin,anion exchange resin.
Hebei Yingbo Certification Co.,Ltd.


COPY
OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEM
CERTIFICATE OF REGISTRATION
Hebei Lijiang Biotechnology Co.,Ltd.
GB/T 45001-2020/ISO 45001:2018
Production of cation exchange resin,anion exchange resin.
Hebei Yingbo Certification Co.,Ltd.


副本
ENVIRONMENTAL MANAGEMENT SYSTEM
CERTIFICATE OF REGISTRATION
Hebei Lijiang Biotechnology Co.,Ltd.
GB/T24001-2016/ISO14001:2015
Production of cation exchange resin,anion exchange resin.
Hebei Yingbo Certification Co.,Ltd.

Appendix I

Storage and transportation of resin

1.When the ion exchange resin is stored for a long time or needs to be stored in the disabled equipment for a long time, the strong resin (strong acidic and strong basic resin) should be changed into salt type, and the weak resin (weak acidic and weak basic resin) can be changed into corresponding hydrogen type, free amine type, or salt type to maintain the stability of resin performance. Then soak in pure water. If it is necessary to drain the water from the deactivated equipment, it shall be sealed to prevent the loss of water in the resin.

2.Ion exchange resin contains a certain amount of balanced moisture, which should be kept wet during storage and transportation to prevent dehydration of the resin. The resin shall be stored indoors or in a covered place, and the ambient temperature is preferably between 5 ℃ -40 ℃. Bagged resin should avoid direct sunlight, away from boilers, heaters and other heating devices to avoid dehydration. If it is found that the resin has been dehydrated, do not put the resin directly into water, so as to prevent the dry resin from swelling sharply and breaking when encountering water. According to the degree of dehydration of the resin, add about 10% salt water slowly to the resin, and gradually dilute it with clean water after soaking for several hours.

3.When the ambient temperature is ≤ 0 ℃, in order to prevent the resin from cracking due to internal moisture freezing, insulation measures should be taken, or according to the temperature conditions, the resin should be stored in the corresponding concentration of salt water to prevent freezing and cracking. If it is found that the resin has been frozen, it should be allowed to slowly and naturally thaw, and mechanical force should not be applied to the resin.

4.For the resin placed in the exchanger due to long-term shutdown, in order to prevent irreversible pollution of the resin by microorganisms (such as algae, bacteria, etc.), the resin must be thoroughly reverse cleaned before shutdown to remove suspended substances accumulated during operation, and pay attention to regular flushing and water change, or take the following measures after thorough backwashing:

Anion resin: use 10%NaCl+2%NaOH mixed solution with 3 times the resin volume to pass through the resin layer twice, soak for several hours at rest each time, and then drain the solution. If necessary, rinse the resin layer with 0.2%H2O2 (hydrogen peroxide) solution twice the resin volume before restart.

Cation resin: 0.5% formaldehyde solution can be filled into cation exchanger and pipe system, and maintain this concentration during shutdown. It can also be soaked in salt water. Wash with 0.2%H2O2 (hydrogen peroxide) or 0.5% formaldehyde solution before restarting the equipment.

The relationship between salt concentration and freezing point is shown in the table below:

concentration	5%	10%	15%	20%	23.5%
freezing point	-3℃	-7℃	-10.8℃	-16.3℃	-21.2℃

Appendix II

Pretreatment of resin

A small amount of Organic Oligomers and some inorganic impurities are inevitably brought into the industrial products of ion exchange resins in the process of manufacturing, transportation and filling. In the early stage of use, it will gradually dissolve and release, affecting the quality of effluent or product. Therefore, the new resin must be pretreated before use.

The specific method is as follows:

After the resin is loaded into the exchanger, the resin layer is backwashed with clean water, and the unfolding rate is 50-100% until the water is clear, odorless, and free of finely broken resin.

Use 4-5%HCl solution about twice the volume of resin to pass through the resin layer at a flow rate of 2m/h. Soak for 4-8 hours and drain the acid solution after all are filled.

Rinse with clean water until the effluent is nearly neutral, and the flushing flow rate is 10-20m/h.

Dissolve in 2-5% NaOH about twice the volume of resin Liquid, fill and soak according to the method of adding HCl solution above. Drain the alkali liquor and flush it with clean water until the effluent is nearly neutral. The flushing flow rate is the same as above.

If the acid and alkali solutions can be repeated for 2-3 times, the effect will be better.

When the pretreated resin is put into operation for the first time, the amount of regenerant should be doubled to ensure that the resin can be fully regenerated.

Appendix Ⅲ

Treatment methods after resin pollution

Pollution blockage and treatment of suspended solids

The suspended solids in the raw water will block the pores in the resin layer, thus increasing its water flow resistance, increasing the operating pressure drop, and will also cover the surface of the resin particles, thus reducing the working exchange capacity of the resin.

In order to prevent the pollution blockage of suspended solids, it is mainly to strengthen the pretreatment of raw water to reduce the content of suspended solids in water. In order to remove the suspended solids accumulated in the resin layer, methods such as increasing the number and time of backwashing or scrubbing with compressed air can be adopted.

Iron pollution and treatment

Iron pollution may occur in both cation and anion resins. The appearance of the contaminated resin is dark brown, and can turn black in severe cases. The presence of iron will accelerate the degradation of anion resin. Iron in cation resin mainly comes from iron ions in raw water, especially when iron salt is used as coagulant, a large amount of Fe^{3+} in industrial hydrochloric acid, It will also cause certain iron pollution to the resin. Iron pollution of anion resin mainly comes from regeneration solution, and the iron content is sometimes many times larger than that of cation resin. After the resin is contaminated by iron, it cannot be removed in the general regeneration process and must be treated. Generally, high concentration hydrochloric acid (10%-15%) with inhibitors is used to soak the resin for 5-12 hours, or even longer. Citric acid, aminotriacetic acid, EDTA and other complexes can also be used for treatment.

Pollution and treatment of calcium sulfate

When using sulfuric acid to regenerate calcium cation resin, if the operation is improper, calcium sulfate precipitates may be precipitated in the resin layer. At this time, it is not only difficult to clean after regeneration, but there is always hardness in the wash out liquid, which will affect the operation of ion exchange reaction and dissolve in the effluent water, increasing the hardness content and reducing the exchange capacity of cation bed. The measures to prevent calcium sulfate precipitation are to reduce the concentration of sulfuric acid in the regeneration solution and to speed up the flow rate of the regeneration solution. Step by step regeneration method can also be used to gradually increase the concentration of regeneration solution and gradually slow down the regeneration flow rate. Once it is found that calcium sulfate precipitates in the resin, the most common method is to backwash with a large amount of soft water first, and then wash repeatedly with 10% HCl(3 bed volumes) at 2.0bv/h. However, it must be noted that the dissolution rate of HCl and calcium sulfate is very slow, so backwashing must be repeated. Another method is to use sodium EDTA salt, but the price is very high, and it is an exothermic reaction, so attention should be paid to it when using.

Silicon pollution and treatment

Silicon compound pollution occurs in strong base anion exchangers, especially in equipment and systems where strong and weak anion resins are combined, which often leads to the decline of silicon removal effect of anion exchangers. Silicon pollution refers to the silicate regenerated from the resin during the regeneration process. Due to the reduction of the pH of the regeneration solution, a large amount of silicic acid precipitates in colloidal state and is coated on the resin surface, affecting the exchange capacity of the resin and causing the increase of SiO_2 content in the effluent.

The reason for this pollution is that the regeneration is not sufficient or the resin fails to regenerate in time. The treatment method can be dissolved by soaking in dilute warm lye. The concentration of alkali liquor is 2% and the temperature is 40 ℃. In case of serious pollution, 4% sodium hydroxide solution heated to 40 ℃ can be used for cyclic cleaning.

Oil pollution and treatment

The pollution of mineral oil to resin is mainly adsorbed on the framework or coated on the surface of resin particles, resulting in the fouling of resin micropores, resulting in the reduction of resin exchange capacity and the obvious reduction of periodic water production. At this time, first find out the cause, eliminate the fault, and prevent the oil from continuing to leak in. The resin contaminated by oil can be circularly cleaned with 60 ℃ 8%-10% sodium hydroxide solution, and the solution concentration shall be maintained during cleaning. It can also be cleaned with appropriate solvents (such as petroleum ether, 200 solvent gasoline) or surfactants (such as PVC octyl phenol).

Organic pollution and treatment

Styrene based strong base anion exchange resins are susceptible to organic contamination, with symptoms such as: (1) darkening of resin color; (2) Reduced work exchange capacity; (3) The pH value of the effluent decreases; (4) The conductivity of the effluent increases; (5) The silicon dioxide content in the effluent increases; (6) The amount of cleaning water increases.

The basic measure to prevent organic pollution is to remove as much organic matter as possible from the raw water during pre-treatment, and use anti pollution resins such as macroporous weak alkali anion resins, and even acrylic anion resins. The commonly used resuscitation methods is the alkaline salt method, which uses a mixed liquid of 10% NaCl+4-6% NaOH, with a dosage of 3 resin bed volumes, and flows through the resin layer at a slow flow rate. After the second bed volume is introduced, soak the resin for 8 hours or leave overnight, and then introduce the third bed volume mixed liquid. The mixed liquid needs to be heated to 40 ℃. If about 1% sodium phosphate or sodium nitrate is added to the mixed liquid, or the resin layer is stirred with compressed air, the effect is better.

When the alkaline salt method is not effective, it can be considered to use sodium hypochlorite solution for cleaning. At this point, in a single bed or mixed bed system, first pass at least one bed volume of 10% NaCl solution through the resin layer to completely render the resin ineffective. The concentration of sodium hypochlorite solution is 1% of the effective chlorine content, and the dosage is 3 resin layer volumes. Soak the second bed volume solution in the resin bed for 4 hours without heating the solution. Finally, trace amounts of sodium hypochlorite must be rinsed (rinsed) thoroughly (including the waste liquid in the sewer).