A400

Gel type Strong Base Anion Exchange Resins

A400 resin is a gel-type strong base anion exchange resin made by introducing quaternary amine groups onto a styrene-divinylbenzene copolymer backbone. The strong base groups undergo complete ionization and can dissociate exchangeable anions in acidic, neutral, and alkaline environments, effectively removing the corresponding anions from the solution system.

Scope of Application

A400 resin is mainly used for the exchange adsorption and removal of anions in various systems, including pure water production, high-purity water preparation, wastewater treatment, and biochemical product extraction, among others.

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Product Model	A400
Physical Appearance	Pale yellow or golden yellow spherical particles
Particle size (0.315–1.25 mm) (%)	≥95
Moisture content (%)	48–52
Shipping Weight (g/ml)	0.68–0.72
True Density (g/ml)	1.07–1.10
Mass exchange capacity (mmol/g)	≥3.8
Volume exchange capacity (mmol/ml)	≥1.3
Whole Beads Count (%)	≥95

Method of Application

1. Resin Column Packing (Using Wet Packing Method)

A Laboratory

Weighing: Mix a certain amount of resin with deionized water in a beaker, then pour the mixed resin solution into a graduated cylinder, allowing the resin to settle completely. By adding and removing as necessary, adjust the resin bed level to align with the corresponding markings on the cylinder, thus completing the resin weighing process.

Packing: Close the outlet valve at the bottom of the ion exchange column, and use water to transfer all the resin from the graduated cylinder into the ion exchange column. Then, open the outlet valve of the column to allow the resin to settle and compact inside the column. Finally, close the outlet valve of the column and keep it for later use. (Note: Ensure that the liquid level remains 1–2 cm above the resin bed to prevent drying out of the column.)

B Industrial Scale

Before packing new resin into the column, it is necessary to clean the resin exchange column and related pipes with water and alkaline solution to remove solid waste such as welding slag and dust, as well as other impurities adhering to the column and pipe walls. Then, inject 1/3 of the column's volume of water into the column and add a small amount of resin through the top manhole of the column. Close the manhole, continue filling the column with water, and simultaneously open the drain valve at the bottom of the column. Use a sieve with a mesh size of ≥80 to intercept any resin particles at the drain outlet and observe if there is any resin leakage. If there are a few small particles, it is considered normal. However, if a significant amount of large resin particles appear, it indicates a problem with the filtration plate at the bottom of the column. In such cases, the resin and water should be drained, the welding seams and water cap of the filtration plate should be inspected, and the cause should be identified for repair. After completing the repairs, repeat the above testing procedure until it meets the requirements, and then add the remaining resin to the column.

Once the resin packing is completed, perform a reverse wash of the resin using deionized water. Control the wash flow rate at 2–4 BV/h and wash for approximately 1 hour. Stop the water wash and allow the resin to settle naturally. Then, perform a forward wash of the resin bed using deionized water. Control the wash flow rate at 4–6 BV/h and wash for approximately 1 hour before stopping.

2. Resin Pre-treatment

First, perform column treatment using a 4% sodium hydroxide (NaOH) solution. Control the treatment flow rate at 1–2 BV/h with a treatment volume of 3–4 BV. After the treatment, perform column rinsing with deionized water to remove any residual alkali in the resin bed and resin pores until the outlet pH is ≤10. Stop the water rinsing and ensure a liquid level layer of at least 20–30 cm is retained on top of the resin bed to prevent drying out.

Next, perform column treatment using a 4% hydrochloric acid (HCl) solution. Control the treatment flow rate at 1–2 BV/h with a treatment volume of 3–4 BV. After the treatment, perform column rinsing with deionized water to remove any residual acid in the resin bed and resin pores until the outlet pH is ≥4. Stop the water rinsing and ensure a liquid level layer of at least 20–30 cm is retained on top of the resin bed.
Finally, perform column treatment again using a 4% sodium hydroxide (NaOH) solution. Control the treatment flow rate at 1–2 BV/h with a treatment volume of 3–4 BV. After the treatment, perform column rinsing with deionized water to remove any residual alkali in the resin bed and resin pores until the outlet pH is ≤10. Stop the water rinsing and ensure a liquid level layer of at least 20–30 cm is retained on top of the resin bed for further use.

3.
Resin Adsorption

Before performing column adsorption, the feed solution must undergo necessary filtration pretreatment to remove solid impurities and prevent blockage of resin pores, which may affect the adsorption efficiency of the resin. The adsorption process is typically carried out in a forward flow-through column manner. The recommended adsorption flow rate is generally controlled at 1–3 BV/h. The adsorption state of the resin is determined by measuring the concentration of the target substance in the outlet liquid.

4.
Post-Adsorption Washing

After resin adsorption is completed, perform forward flow-through column washing of the resin bed using deionized water. The washing flow rate is typically controlled at 1–2 BV/h, and the washing duration is usually 1–2 hours. This step is carried out to remove any residual liquid and water-soluble impurities present in the resin bed.

5.
Resin Elution

After the washing step is completed, the resin can be regenerated using a 4% sodium hydroxide (NaOH) solution in a forward flow-through column elution process. The elution flow rate is typically controlled at 1–2 BV/h, and the elution volume is kept within 3 BV.

6.
Post-Elution Washing

After the resin regeneration through elution is completed, perform forward flow-through column washing of the resin bed using deionized water. The washing flow rate is generally controlled at 1–2 BV/h, and the washing duration is usually 1–2 hours. This step is carried out to remove any residual alkali present in the resin bed.

7. Resin Deep Regeneration Treatment

If the resin's exchange capacity decreases after a period of operation, the following method can be used for deep regeneration treatment of the resin.

(1) Acid Regeneration

Perform forward flow-through column treatment using a 4% hydrochloric acid (HCl) solution. Control the treatment flow rate at 1–2 BV/h and treat for approximately 1.5 hours. After the acid regeneration treatment is completed, perform forward flow-through column rinsing using deionized water. The rinsing flow rate should be 2–3 BV/h until the outlet pH is ≥5.

(2) Alkali Regeneration

After the resin has undergone acid regeneration and rinsing, perform forward flow-through column treatment using a 4% sodium hydroxide (NaOH) solution for alkali regeneration. Control the treatment flow rate at 1–2 BV/h and treat for approximately 1.5 hours. After the treatment is completed, perform forward flow-through column rinsing using deionized water. The rinsing flow rate should be 2–3 BV/h until the outlet pH is ≤10.

Note: The resin's pre-treatment and usage methods mentioned above are general guidelines and should be used as references. Different applications and purposes may require variations in the usage and pre-treatment methods. It is advisable to consult with professional technical personnel for specific information and guidance.

Attention

1. During use, it is advisable to avoid repeated loading and unloading of the resin to prevent uneven bed formation that may cause channeling.
2. For short-term shutdowns, the resin should be regenerated and thoroughly cleaned before being immersed in clean water.
3. For long-term shutdowns or when the ambient temperature is below 5 °C during winter, the resin should be soaked in a 15% NaCl solution or a 10% sodium hydroxide (NaOH) solution to prevent bacterial growth and resin freezing.
4. Prior to column loading, the feed solution should undergo necessary filtration treatment to remove solid impurities and prevent resin pore blockage, which may affect resin adsorption efficiency.deionized water. Control the wash flow rate at 4–6 BV/h and wash for approximately 1 hour before stopping.

Package & Storage

1. Maintain the integrity of the internal and external packaging of the resin to prevent contamination and moisture loss.
2. Protect the resin from freezing and excessive heat. Resin is typically required to be stored at room temperature in a dark environment.
3. Avoid storing the resin together with substances that have odors, toxicity, or oxidizing properties.