



Mixed ion exchanger

Brief introduction

Cation Anion mixed ion exchanger, commonly known as mixed bed, is used for further refining of primary pure water. It is generally arranged after the Cation Anion mixed ion exchanger, and can also be used after electro dialysis or reverse osmosis are connected in series. When the inlet water quality is at the general salt content, the salt content of the outlet water can be reduced to less than 0.1mg/l, and the silicon content $\leq 0.02 \mu\Omega / \text{cm}$. The treated high-purity water can be used in high-pressure boiler, electronics, medicine, papermaking, chemical industry and other industrial departments.



Working principle:

The mixed ion exchange method is to place the cation and anion exchange resins in the same exchanger and mix them before operation, so it can be regarded as a multistage compound bed with countless cation and anion exchange resins staggered. The anion and cation exchangers containing salts in water are exchanged by resin to obtain high-purity water.

Cation and anion exchange resins are fully mixed with each other in an ion exchanger for cation and anion exchange at the same time. Mixed bed for short. The so-called mixed bed is to mix and fill a certain proportion of cation and anion exchange resins in the same exchange device to exchange and remove ions in the fluid. Since the specific gravity of cation resin is larger than that of anion resin, the anion resin is in the upper and the cation resin is in the lower in the mixed bed. Generally, the filling ratio of cation and anion resins is 1:2, and there are also filling ratios of 1:1.5, which can be selected according to different resins. The mixed bed is also divided into internal synchronous regeneration mixed bed and external regeneration mixed bed. During the operation and the whole regeneration process of the synchronous regeneration mixed bed, the resin does not move out of the equipment during regeneration, and the cation and anion resins are regenerated at the same time. Therefore, less auxiliary equipment is required and the operation is simple.

Advantage:

- The effluent quality is excellent, and the effluent pH value is close to neutral.
- The outlet water quality is stable, and the change of short-term operation conditions (such as inlet water quality or composition, operation flow rate, etc.) has little effect on the outlet water quality of the mixed bed.
- Intermittent operation has little impact on the effluent quality, and the time required to restore the water quality before shutdown is relatively short.

The mixed bed equipment is easier to use than the plexiglass column, because it is easier to see clearly when layering.

The regeneration effect is good when operated.

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Structure description:

- a. The regenerated alkali liquor of anion exchange resin of a regeneration device enters the main pipe 300 mm higher than the anion exchange resin surface ($\Phi 400$, $\Phi 500$ and $\Phi 600$ adopt single main pipe for liquid inlet, $\Phi 800$ and $\Phi 2500$ adopt double main pipes (liquid inlet), small holes on the pipes are used for liquid distribution, and the outside of the pipes is covered with plastic window screen 60 mesh nylon mesh. The regenerated acid of cation exchange resin enters from the drainage cap on the perforated plate of the bottom drainage device.
- b. Intermediate discharge device the intermediate discharge device is set on the interface of anion and cation resin, which is used to regenerate and discharge acid and alkali reducing solution and flushing type. The type is divided into double main pipe or branch main pipe type, and the small hole of the pipe is covered with plastic window screen and 60 mesh nylon mesh.
- c. The drainage device adopts perforated plate, which is equipped with PB2-500 laminated drainage cap or pagoda ABS drainage cap. The material of perforated plate varies according to the equipment specification ($\Phi 400$, $\Phi 500$ and $\Phi 600$ are made of UPVC porous, $\Phi 800$ and $\Phi 2500$ models adopt steel lined rubber perforated plate).
- d. The diameter of water inlet and outlet pipes is 1.5m/s according to the flow rate of working medium in the pipe.
- e. Backwash expansion rate of resin: due to the different backwash expansion rates of anion exchange resin, combined with the actual operation experience, the backwash expansion rate is 100%. A mirror is set at the interface of cation and anion resin, the resin surface layer and the maximum backwash expansion height to observe the resin surface and backwash resin.
- f. Resin transportation: hydraulic transportation is considered for resin input and discharge. A resin input port is set at the upper part of the cylinder, and a resin discharge port is set at the lower part of the shell near the perforated plate.