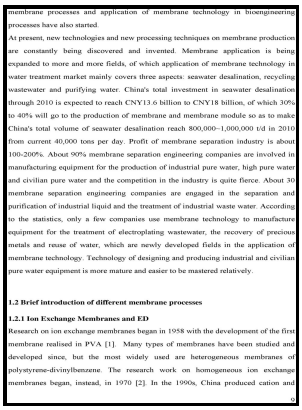
Demineralization by ion exchange in water treatment and chemical processing of otherliquids

Academic Press - 10 ion exchange process


membrane processes and application of membrane technology in bioengineering processes have also started.

At present, new technologies and new processing techniques on membrane production are constantly being discovered and invented. Membrane application is being expanded to more and more fields, of which application of membrane technology in water treatment market mainly covers three aspects: seawater desalination, recycling wastewater and purifying water. China's total investment in seawater desalination through 2010 is expected to reach CNY13.6 billion to CNY18 billion, of which 30% to 40% will go to the production of membrane and membrane module so as to make China's total volume of seawater desalination reach 800,000~1,000,000 t/d in 2010 from current 40,000 tons per day. Profit of membrane separation industry is about 100-200%. About 90% membrane separation engineering companies are involved in manufacturing equipment for the production of industrial pure water, high pure water and civilian pure water and the competition in the industry is quite fierce. About 30 membrane separation engineering companies are engaged in the separation and purification of industrial liquid and the treatment of industrial waste water. According to the statistics, only a few companies use membrane technology to manufacture equipment for the treatment of electroplating wastewater, the recovery of precious metals and reuse of water, which are newly developed fields in the application of membrane technology. Technology of designing and producing industrial and civilian pure water equipment is more mature and easier to be mastered relatively.

1.2 Brief introduction of different membrane processes

1.2.1 Ion Exchange Membranes and ED

Research on ion exchange membranes began in 1958 with the development of the first membrane realised in PVA [1]. Many types of membranes have been studied and developed since, but the most widely used are heterogeneous membranes of polystyrene-divinylbenzene. The research work on homogeneous ion exchange membranes began, instead, in 1970 [2]. In the 1990s, China produced cation and c

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What Is Ion Exchange?

Sufficient alkalinity also reduces the corrosiveness of water to iron pipes. Alternately, water purity can be quickly estimated on the basis of electrical conductivity or resistance — very pure water conducts electricity poorly, so its resistance is high. Not only does high-purity water rapidly pick up contaminants - such as carbon dioxide CO 2 - that affect its pH, but it also has a low conductivity that can affect the accuracy of pH meters.

Problems of Ion

Water treatment for the refining industry needs to be safe, reliable, and economical. Chlorine disinfection Main article: The most common disinfection method involves some form of or its compounds such as or.

DEMINERALIZATION(DM) WATER TREATMENT PLANTS

Capacity is defined as the amount of exchangeable ions a unit quantity of resin will remove from a solution. This water flow displaces the regenerant through the bed at the desired flow rate.

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Depending on the through which the water has flowed, other ions may also be present including , and.

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Whenever aluminum coagulants are used ahead of zeolite softeners, proper equipment operation and close control of clarifier pH are essential to good softener performance. The addition of inorganic coagulants such as or or iron III salts such as cause several simultaneous chemical and physical interactions on and among the particles.

Demineralized water system

Weak Acid and Weak Base Resins Weak functionality resins have a much higher regeneration efficiency than their strong function-ality counterparts. Mixed-bed IX Mixed-bed exchangers offer a higher water quality compared to twin-bed systems. When its capacity is exhausted, the resin can be regenerated with an excess of mineral acid.

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Simple procedures such as or the use of a household filter are not sufficient for treating all possible contaminants that may be present in water from an unknown source. Widely varied techniques are available to remove contaminants like fine solids, micro-organisms and some dissolved inorganic and organic materials, or. While the chemistry of individual ion exchange reactions varies from one application to the next, IX is a treatment process where dissolved ions are replaced by other, more desirable, ions of a similar electrical charge.

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