



DOWEX™ Ion Exchange Resins

Procedure for Calcium Contamination of a Cation Resin

Procedure

Calcium precipitation as CaSO_4 in a cation resin bed is a potential problem with sulfuric acid regeneration. Removal of the Ca with hydrochloric or nitric acids is only partially effective, as the solubility of CaSO_4 in these media is also relatively low. A more effective treatment is to use a complexing agent for Ca removal. The most effective is sodium citrate, but also NH_4Cl may help.

The detailed cleaning steps have to be adapted to each regeneration process (coflow, different types of counterflows).

Used, mechanically weak resins, may suffer from large osmotic (fast swell/shrink) and mechanical (air scrubbing) strains. It is advisable to use gradual changes in solution concentrations and to minimize the mechanical stress.

The recommended procedure is as follows:

1. Air scour and loosen the resin bed as much as possible.
2. Carry out the normal regeneration sequence for the cation resin.
3. Exhaust the bed with NaCl.
4. Pass upflow 1 bed volume of 10% sodium citrate over 20-30 minutes.
5. Leave to soak overnight, if possible with occasional air injection, to facilitate contacting of the citrate with the resin.
6. Displace/rinse the citrate downflow with minimum 5 bed volumes DI water.
7. Backwash the resin and then carry out a double regeneration (same acid concentration at double the injection time).
8. Check the Ca concentration in the feedwater and adjust the acid concentration accordingly.

Note: WAC resins may swell up to 60% when converted to the Na form.

Note for the plant operator: At the first sign of pressure drop increase during H_2SO_4 regeneration, stop the injection of acid and displace the reaction products with the highest water flow possible.

DOWEX™ Ion Exchange Resins
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Warning: Oxidizing agents such as nitric acid attack organic ion exchange resins under certain conditions. This could lead to anything from slight resin degradation to a violent exothermic reaction (explosion). Before using strong oxidizing agents, consult sources knowledgeable in handling such materials.

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