REV 0521

Resin Fouling - Hardness Fouling of Anion Resins

Anion resin can foul from the precipitation of hardness. Effective removal of this deposit uses a strong acid solution and must take into consideration the resin vessel materials of construction. The distribution internals may contain metals which will corrode under acidic conditions. Hydrochloric acid (HCl) is the best acid to use for the redissolving of hardness compounds. Check construction materials before using acids.

1. Backwash with warm water. If the resin bed does not backwash because of clumps of resin and foulant, utilize air lancing to free the resin bed. This can be done by injecting air into the bed from the top manway by a long pipe probe. The water in the vessel should be drained to just above the resin level to assist in the cleaning action. After lancing, backwash and lance again until resin is free-moving, without clumping.

2. Brine the resin to place it in the chloride form using two bed volumes of a 10% brine solution. Brine can be left in the vessel if chemical cleaning is the next step.

3. Inject a 4% hydrochloric acid solution for 1 bed volume of resin and soak for 1 hour. Flush from the vessel with decationized or demineralized water. If fouling is still present, refill the vessel with 10% Hcl solution and soak for 4 hours.

4. Flush the resin with 1 tank volume of decationized water followed by a 45 minute backwash. The calcium should dissolve in the acid solution, but smaller particles may remain requiring backwash. Sulfuric acid can be used instead of hydrochloric acid. The first step should have a 1% acid solution and the second step should have a 4% acid strength. This should minimize the potential for calcium sulfate precipitation as a result of initial acid introduction. Rinsing/backwashing is more critical here than in the hydrochloric acid approach.

5. Regenerate the resin after cleaning with a 15 to 20 lbs/cu.ft. chemical dosage through the system to assure complete conversion, then follow with a normal rinse.

The above recommendations are general guidelines which require knowledge of the materials of construction of the vessel, internals and liners. It must be noted that there is no guarantee this will remove sufficient calcium to restore the resin to a useful life, which is dependent upon the extent of the fouling and the quality of the cleanup attempt.

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