



DOWEX™ Ion Exchange Resins

Procedure for Brine Cleaning of Anion Resins

Introduction

Brine cleaning is an effective treatment for removing organic contaminants on strong and weak base anion resins in demineralizers, organic traps and dealkalizer units. If organic levels in the feed water are high, it is advisable to carry out regular brine treatments as part of a preventive maintenance program, as heavily fouled resins may not be completely restored with this treatment. An alternative is to install an organic filter as pretreatment to the demineralization line. Weak base resins can also be effectively cleaned with NaOH.

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

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.

Procedures

The recommended procedure is as follows:

1. If possible, air scrub and then backwash the bed to loosen and clean it prior to the treatment.
2. Drain the bed.
3. Apply about 1-2 bed volumes (10 gal/cu.ft) of a 10% NaCl/1% NaOH solution. Drain to bed level over 1 hour until the original dark color becomes light tea color and allow to soak for a further 3-16 hours. It is preferable to use an alkaline brine solution warmed up to approximately 50°C (120°F) for type I strong base and weak base anion resins or 40°C (105°F) for type II strong base anion resins.
4. If possible, displace with another 1 BV of the same solution until clear effluent is observed.
5. Displace with 2-3 bed volumes of soft water (15-20 gal/cu.ft) over 20-30 minutes.
6. Rinse out with 3-5 bed volumes of DI water (20-40 gal/cu.ft).
7. Double regenerate the resin (same NaOH or brine concentration, but double the contact time).
8. Rinse and return the unit to service.

Notes: Steps 4 to 5 may need to be repeated in case of heavy fouled resins.
Expect the first run to give an earlier conductivity break.
Cation effluent or soft water must be used for the make-up and rinse solutions. Use Ca free NaCl. If not sure, prepare the alkaline brine solution a let settle overnight. Use the supernatant only. Hot solutions will increase the efficiency of the cleaning and regeneration. Recirculation of the cleaning solution, for the contact time specified, will also increase the efficiency of the cleaning.

Procedures (cont.)

The following procedure can be applied to weak base anion resins:

1. If possible, air scrub and then backwash the bed to loosen and clean it prior to the treatment.
2. Drain the bed.
3. Apply about 1-2 bed volumes (10 gal/cu.ft) of a 10% NaOH solution. Drain to bed level over 1 hour until the original dark color becomes light tea color and allow to soak for a further 3-16 hours. It is preferable to warm up the solution to approximately 50°C (120°F).
4. If possible, displace with another 1 BV of the same solution until clear effluent is observed.
5. Displace with 2-3 bed volumes water (15-20 gal/cu.ft) over 20-30 minutes.
6. Rinse out with 3-5 bed volumes DI water (20-40 gal/cu.ft).
7. Return the unit to service.

DOWEX™ Ion Exchange Resins For more information about DOWEX resins, call the Dow Liquid Separations business:

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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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