

## Resin Fouling - Oil Fouled Cation Resins (Caustic Procedure)

Cation resins, strong acid or weak acid, may become fouled with fats, oils, proteins or nitrogenous matter to such an extent that both exchange capacity and exchange rate are lowered. These fouling materials may be present in surface water supplies, condensate and process liquids. They are generally not removed by the normal regeneration solutions, namely, hydrochloric or sulfuric acids.

One of the most efficient removal methods is by means of warm caustic soda solution containing a small amount of detergent. It is first necessary to remove those cations which could form insoluble precipitates with caustic soda. This is done using the normal regeneration procedure with a saturated brine solution. The following procedure may be used:

1. Brine the resin with a warm 10% brine solution at 0.25 gpm/cu. ft. flow rate and 10 lbs/cu. ft. dosage of NaCl (100% basis). Let resin bed soak in last portion of brine at least 1 hour. Then rinse the excess salt out of the resin bed using 20 to 30 gallons of water per cubic foot.
2. Use 8 lbs/cf of sodium hydroxide. Add one ounce per cubic foot of resin of a non-ionic detergent to the sodium hydroxide solution.

Draw the solution into the cation exchanger from the caustic regenerant tank, using soft water, at a concentration of 5% NaOH and let the oil fouled resin sit in the solution.

3. The caustic solution should stand in contact with the resin for one hour. The vent line, if there is one at the top of the tank, should be left open during this period. After one hour, the caustic solution is rinsed from the bed, using soft water fed to the top of the unit. Rinsing should be continued until all the caustic is rinsed from the resin bed. The unit is then backwashed at the normal backwash rate until the wash water is clear.
4. The resin is then regenerated twice, or once using 2 times the normal amount of acid. If stepwise regeneration is used, simply double the duration of the final regenerant stage, to get complete regeneration. The resin is then ready to return to service.

If this type of fouling occurs frequently, the use of backwash water at a temperature of 90° to 100°F has been found to be a good preventative.

