



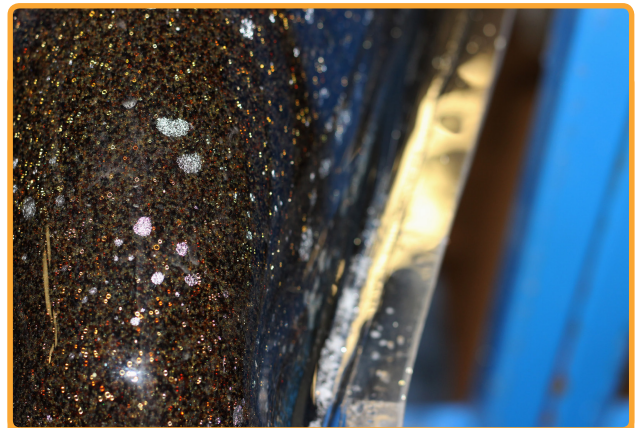
WATER SOFTENING

Many water sources are described as “hard” water, meaning that they have a high concentration of calcium and magnesium carbonates. When these substances are dissolved in water, calcium and magnesium cations (Ca^{2+} and Mg^{2+}) are released. The resulting concentration of these multivalent cations is the official measurement of water hardness, and may be reduced through the use of ion-exchange resins.

When the resin is fresh it contains sodium ions at its active sites. When in contact with a solution containing magnesium and calcium ions (but a low concentration of sodium ions), the magnesium and calcium ions preferentially migrate out of solution to the active sites on the cation resin, being replaced in solution by sodium ions. This process reaches equilibrium with a much lower concentration of magnesium and calcium ions in solution than was started with.



Separated Resin Beaker



Mixed Bed Close-Up

The resin can be recharged by washing it with a solution containing a high concentration of sodium ions (i.e. it has large amounts of common salt (NaCl) dissolved in it). The calcium and magnesium ions detach from the resin's active sites, being replaced by sodium ions from solution until a new equilibrium is reached.

Hard water can be detrimental to industrial machinery and greatly reduce the lifespan of expensive equipment. Water softeners are widely used in preparing boiler feed water to reduce the amount of scale buildup in the boilers. Cooling towers also utilize softened water in their unit operations, in addition to many cleaning water applications in which scale buildup is not tolerated.

CALL TODAY FOR OUR WIDE RANGE OF WATER TREATMENT SOLUTIONS!

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