Technical Note

Salt Quality for MIEX® DOC Resin Regeneration

A Sodium Chloride solution is used to regenerate the MIEX® DOC Resin. This note provides guidance with re-spect to suitable grades of salt to use for regeneration. If a proposed salt grade to be used by the utility operat-ing a MIEX® DOC Facility does not meet the recommended guidelines, then an Ixom representative should be consulted to provide an accurate estimate of potential impacts.

Most commercially available bulk chloride salts are suitable for MIEX® DOC Resin regeneration. Availabil-ity, logistics, and pricing will usually determine which form and grade will be recommended. Because of the volumes required to regenerate the resin, a bulk form, rather than a packaged form, is generally preferred. However, bulk bags are an option if the plant is already set-up for this.

For a majority of situations a bagged or bulk solar salt should be suitable, available, and cost-effective for use in regeneration of MIEX® DOC Resin. The difference in quality between solar salts and higher grade salts will not provide a significant difference in regeneration efficiency. Mined rock salt should be avoided for MIEX® Systems, due to higher levels of impurities that have the potential to scale system piping, valves, and screens.

Salt containing specific additives such as "rust remover," "rust dissolving," and "resin cleaning" additives should NOT be used with MIEX® DOC Resin. Such additives act similarly to impurities, interfering with the regeneration process and reducing anionic contaminant removal efficiency. This type of salt is usually sold as pellets, and should be avoided.

Salt quality specifications are determined by considering the specific application of MIEX® DOC Resin, and the potential impacts that impuri-ties may have on the process. The key impurities impacting MIEX® DOC Resin regeneration are sulphate (SO42-), calcium (Ca2+), magnesium (Mg2+), iron (Fe2+, Fe3+), bromide, (bi)carbonate, total insoluble matter, and organics.

The key impact of impurities is that impurities may be captured by the resin pores during regeneration. High levels of sulphate-containing water in the pore can interfere with DOC take-up during the contactor stage of the process. This is due to the comparable affinity that MIEX® DOC Resin has for both DOC and sulphate. This may reduce the level of steady-state DOC removal from the process. Anoth-er consideration is the potential for scale to form when treating water that is high in hardness and/or high in silicate. Calcium, iron, and magnesium may form carbonate or silicate deposits that may physi-cally 'coat' the resin and inhibit DOC uptake. Again, the potential result is reduction in steady-state DOC removal by the MIEX® DOC resin.

Recommended Maximum Concentrations For Selected Salt Impurities

Impurity	Recommended Maximum Concentration, Dry Weight Basis
Sulphate, as SO42-	5,000 ppm
Calcium, as Ca2+	900 ppm
Magnesium, as Mg2+	600 ppm
Iron, as Fe2+/Fe3+	30 ppm
Total water insolubles	0.15% w/w

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Visit our website at www.ixomwatercare.com or contact your nearest Ixom office for more information or to inquire about a specific application.

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Information should be sought from the salt supplier with regards to other potential impurities such as Lead, Arsenic, and Copper. Typical solar salt should have very low levels of these three elements. Elevated levels of these should be discussed with your Orica representative to determine any effect on the treated water produced by the MIEX® DOC Process.

Bromide

Bromide is a common impurity in salts sourced from a marine or coastal location. Systems that use ozone post-MIEX® Process treatment need to consider the bro-mide levels in the raw salt. Bromide can form bromate when exposed to high ozone residuals in systems that are ozonating waters containing DOC less than 3 mg/l. Bromate is regulated in drinking water at a level of 10 ppb (MCL). Consult your Ori-ca representative in the case of ozone systems used post-MIEX® Process treatment, or for high-bromide water sources, to estimate the impact that the bromide may have on the treated water.

Standards

The American Water Works Association (AWWA) has established a standard for sodium chloride used as a regenerant for cation exchange resins. The standard designation is AWWA B200-07. Salt conforming to this standard may be used if the impurities listed above for MIEX® DOC Resin are within the limits shown.

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