



DOWEX Ion Exchange Resins

Color Release from Cation Resins

Strong acid cation ion exchange resins are manufactured by the sulfonation of a polystyrenic matrix made by polymerizing styrene with di-vinylbenzene as cross-linker. This is a chemically very resilient structure and strong acid cations are one of the most stable types of ion exchange resins, being able to withstand temperatures of 120-150°C (250-300°F).

Under extreme conditions (e.g., in the presence of strong oxidizing agents), degradation of strong acid cation resins can occur, usually by de-crosslinking of the polystyrene matrix leading to increased water retention capacity and swelling of the resin. (See "Recommended for Maximum Chlorine Limits for DOWEX* Cation Exchange Resins.")

However, under less extreme operating conditions, it is more likely that any de-crosslinking of cation exchange resins will give rise to the formation of low levels of oligomers of sulfonated polystyrene inside the resin beads, typically in the low ppm or ppb range. This occurs, for example, when the resin is exposed to light or air or has been left standing for prolonged periods of time. It can affect both new and used resins, but at such a low level of degradation, the standard characteristics of the resin (capacity, water retention) will not be measurably affected.

Sulfonated polystyrene leach from the resin is recognizable as a yellow, orange or red coloration either in the surrounding water, or on the resin itself (if it has been drained). As the sulfonated polystyrene is a form of total organic carbon (TOC), it may result in product water becoming out-of-specification in sensitive applications. It may cause other downstream problems, for example, fouling of an anion resin or sulfate corrosion. It is, therefore, recommended to rinse any affected resin with up to 20 bed volumes of water to remove this residual TOC before putting the resin into service.

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DOWEX

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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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