Dow Answer Center

DOW Ion Exchange Resins - Anion Resins - *Odor*

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Why do anion exchange resins have an *odor*?

Anion exchange resins, especially strong base anion exchange resins in the hydroxide form, may emit *odors* such as a dead *fish* smell. The main cause is release of very low levels of amines from the resin (trimethylamine for type I strong base resins). The amines are released due to slight de-amination of the resin by the Hofmann's reaction. This is the primary degradation mechanism for anion exchange resins. Higher temperature will accelerate the rate of resin de-amination, as will allowing the resin to dehydrate (become dry). Amines, such as trimethylamine, have a very low *odor* threshold (5 ppb) and will be smelled at levels well below the hazardous limits established by regulatory agencies. Trimethylamine is also released by decomposing *fish*, hence the association of the resin *odor* with a dead *fish*.

During regeneration of the anion resin with sodium hydroxide an amine smell may be noticed. To avoid nuisance by the smell, it may therefore be necessary to operate in a well ventilated room. Upon insufficient ventilation (for 8-Hour time weighted average of more > 4.9 mg/m^3 trimethylamine) it is recommended to use respiratory protection.

If desired, the amines can be quickly rinsed from the resin using deionized water before placing the resin into service. The total exchange capacity and salt splitting capacity of the anion exchange resin should not be measurably changed by the slight levels of de-amination that occur under normal storage conditions.