METHOD TO DISPOSE USED ION EXCHANGE RESINS

The major applications of Ion Exchange resins are in:

• Industrial water treatment processes

• Applications like deionisation, softening, dealkalisation of various process liquors like starch hydrolysates, brine solutions, etc.

The various grades/brands of synthetic ion exchangers are solid copolymers (matrix) of styrene, acrylic and divinyl benzene containing active functional groups like sulphonic acid, carboxylic acid, secondary, tertiary or quarternary ammonium groups.

Before the safe disposal of spent or used ion exchange resins, one must have an information about:

• The type of ion exchange resins ie. cationic or anionic

• The application in which it is being used

• The form in which it exists for disposal ie. hydrogen or acid form for cationic and chloride, hydroxide form for anionic grade of resin.

As the ion exchange resin matrix is insoluble and non bio-degradable, only the active form ie. exchangeable ion of the functional group is of importance for selection of “safe disposal” method.

The active hydrogen or acid form of cation resin may likely be exchanged with counter cation available in its contact, thereby likely to form corresponding acid in its surrounding.

The heavy/poisonous metalic ions of cation exchanger are likely to contaminate the soil.

The chloride form of anion exchanger is more stable for safe disposal.

We suggest:

A. Pretreatment

• The cationic type of ion exchange resin (Strongly Acidic and Weakly Acidic) are to be regenerated with 5-7% w/v.hydrochloric acid and rinsed with filtered water
• The resin is further converted into sodium form using 2 bed volumes of 4% w/v sodium chloride/sodium hydroxide. It is then rinsed with soft water and kept ready for safe disposal
• The anionic type of ion exchange resins (Weakly Basic or Strongly Basic) are to be regenerated with 2 bed volumes of 4% w/v. sodium hydroxide as usual and rinsed with soft water
• The anionic resins are to be further treated with 2 bed volumes of 5% w/v. hydrochloric acid, rinsed thoroughly and kept ready for “safe disposal”
• The regeneration and rinsed effluent is to be treated separately with conventional effluent treatment systems.

B. Safe Disposal Method

The pretreated spent/used Ion Exchangers can be:

• Send to Common Incineration facility with Government approved, it should be compliance Incinerator norms as per government environment protection Rule.

• Land fill is not allowed.