REV 0421

Chrome Recovery

Chrome recovery from rinse waters can offer considerable savings in industrial waste treatment. For recovery of spent chromic acid in plating baths, the chromic acid can first be passed through a cation exchange resin to remove other ions such as iron, trivalent chrome, aluminum, etc. The effluent from this cation unit can then be passed through an anion exchanger to remove chromate and to obtain demineralized make-up water. One of the reasons it is recommended to pass the rinse water through the cation unit first is to avoid precipitation of metal hydroxides on the anion resin.

The anion exchanger is regenerated with sodium hydroxide and releases the chromium as sodium dichromate ($Na_2Cr_2O_7$). This regeneration waste stream can then be passed through another cation exchanger operating in the hydrogen cycle to convert the sodium dichromate back to chromic acid. This treatment can recover the chromic acid and concentrate it for reuse. The chromic acid content of plating waste waters can vary from 100 to 500 milligrams per liter (CrO_3). The recovered chromic acid has a concentration of about 30,000 milligrams per liter or 3% CrO_3. This is often further concentrated by evaporation up to 30% for re-use in the plating bath.

This process recovers both the chromic acid and the rinse waters and avoids a pollution problem. Reusing the demineralized water from the anion exchanger for rinsing avoids the introduction of additional contaminants into the cycle.

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INNOVATIONS IN ION EXCHANGE

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