

Zinc Removal

(Extracted from the Diaion Manuals pages 221 to 222)

13. Recovery of zinc from Viscose Rayon Spinning waste waters

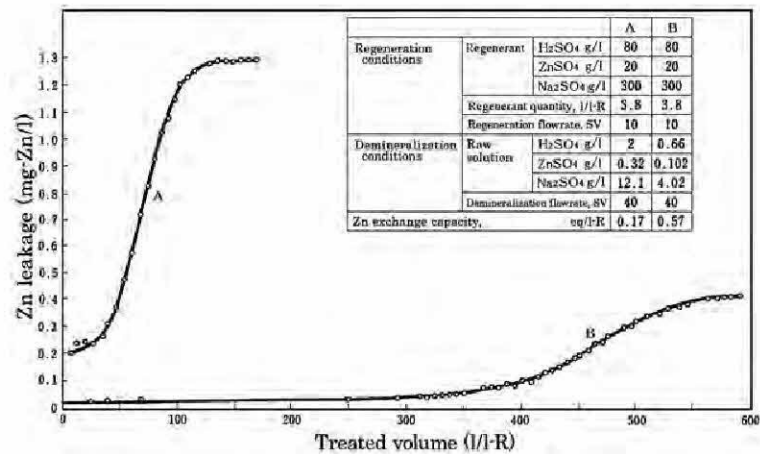
Zinc in waste waters from the viscose process of rayon spinning is adsorbed by SACERs and is desorbed and collected with liquids of coagulation baths. In the viscose process, rayon is manufactured by extruding from a nozzle the viscose solution that cellulose is chemically dispersed and dissolved in cuprammonium liquid into coagulation baths that hold 10% sulfuric acid, 17% sodium sulfate and 1% zinc sulfate.

The waste waters from this process contain sulfuric acid, sodium sulfate and zinc sulfate, and zinc can be collected with SACERs from them. The compositions of the waste waters vary in accordance with those of the coagulation baths of factories. Regarding the cases where zinc concentration is comparatively high to total cations or total cations concentration is low, the zinc leakage is low, the exchange capacity is large and thus the recovery of zinc operates well. Conversely, the recovery operation sometimes becomes difficult in the opposite cases.

The regeneration of CERs that adsorb zinc is performed not only with H_2SO_4 or Na_2SO_4 solutions but also with liquids of coagulation baths.

When HCl solution is used as regenerants, zinc of high purity can be collected by the adsorption as zinc-chloro complex by SBAERs from regeneration waste waters and the following desorption from SBAERs with water.

Fig.VI-13-1 is an example with SACER, SK1B, regenerated with the liquid of the coagulation bath. Liquids of coagulation baths contain a large amount of zinc and thus the regeneration with such liquids is effective to collect zinc when zinc concentration in raw waste waters is rather low particularly.



[Fig.VI-13-1] Zn recovery from Spinning waste waters

Chelate resin, CR20, is useful to collect ZnSO₄ when ZnSO₄ concentration is low compared to H₂SO₄ or Na₂SO₄ in raw waste waters. Only Zn²⁺ and neither Na⁺ nor Ca²⁺ is adsorbed with CR20 when the raw water is pH-controlled with Ca(OH)₂. CR11 is also applied after such pH-control when Ca²⁺ concentration is low.