Dye Ligand Nanopolymers for Removal of Cr(III) From Leather Waste Water

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1. Introduction

In the leather industry the waste water coming from the chrome tanning process include generally between 2,500- 8,000 mg/L Cr(III). (Fabianil et al. 1996) Although the traditional methods commonly used for removal of chrome ions from aqueous solution, adsorption, which is a more sophisticated technique, has the advantage of allowing the recovery of metallic ions to effective, simple design and easy operate. Also, adsorbent nanopolymers have large surface area due to their nano-structure. (Denizli et al. 1998)

2. Material and Methods

Poly(HEMA) (2-hydroxyethyl methacrylate) nanopolymers were prepared by surfactant free emulsion polymerization. Alkali Blue 6B was then covalently attached to the poly(HEMA) nanopolymers as a dye-ligand in order to adsorp of Cr(III) heavy metal ion. The optimum adsorption conditions (i.e. adsorption capacity, medium pH, adsorption rate) were studied and reusability of nanopolymers was determined using (Thermo Scientific brand UV/Visble Spectrofotometer) at 601 nm.

3. Results

According to results, Cr(III) heavy metal ion from aqueous media on these nanopolymer equilibria were reached in about 15 min at pH 4. Adsorption capacities of it were 4755,87 mg Cr(III) per a gram nanopolymer. Adsorbed metal ions were desorbed up to 96% by using 0.1 M HNO_3 as the desorption agent.

4. Conclusion

Repeated adsorption: desorption processes showed that these novel dye-attached films are very suitable for Cr(III) heavy metal removal because of easy application, repeating again, being nano size system.

5. References

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