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Effects of co-solutes on Cr(VI) removal by micellar enhanced ultrafiltration (MEUF) process

Arunava Choudhury, Siddhartha Sengupta[†], Chiranjib Bhattacharjee*, Siddhartha Datta

Department of Chemical Engineering, Jadavpur University, Kolkata 700032, India
Tel./Fax: +91 33 2414 6203; emails: cbhattacharyya@chemical.jdvu.ac.in, c.bhatta@gmail.com, chiranjib_b@yahoo.com

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ABSTRACT

The effect of electrolyte (NaCl salt) during chromate ($Cr_2O_3^{-2}$) ion separation from effluent by Micellar enhanced ultrafiltartion (MEUF) and leakage of cationic surfactant Cetyl Pyridinium Chloride (CPC) in permeate stream has been studied. It is revealed that though electrolyte (NaCl) reduces the critical micelles concentration of surfactant, but with increase of NaCl concentration in feed, decreases the chromium separation efficiency and increases surfactant, CPC concentration in permeate. The increase of ionic strength of the aqueous medium decreases the adsorption (chemisorption) of negatively charged chromate ions on positively charged CPC micelles, resulting in decrease of Cr(VI) separation by ultrafiltration. Effect of electrolyte on chromium separation at different pH, surfactant concentration is investigated. More than 95% hexavalent chromium is retained at 10 mM electrolyte concentration.

Keywords: Chromium removal; Cetyl Pyridinium Chloride; Miceller enhanced ultrafiltartion; Micelles; BrÖnsted-Bjerrum equation; salt effect in UF

*Corresponding author.
[†]Presently at Indian Institute of Technology, Kanpur, India.