

Removal of chromate using cross-flow micellar enhanced ultrafiltration

이율리아, 백기태¹, 김호정, 양지원*
한국과학기술원; ¹금오공과대학 환경공학과
(jwyang@kaist.ac.kr*)

MEUF, micellar enhanced ultrafiltration, is a separation process which can remove metal ions or dissolved organics from water. In this study, chromate was selected as an anion whereas CPC (cetylpyridinium chloride), a counter-ion surfactant was used to form micelles under aqueous phase. Surfactant solution with chromate was filtrated through the cross-flow ultrafiltration. The removal efficiency of chromate suddenly increased at the molar ratio of chromate:CPC=1:3 and saturated at the molar ratio of chromate:CPC=1:5. CPC rejection increased from 85% to 97% with the increase of CPC concentration. As CPC was concentrated in the retentate, the amount of CPC increased as a function of not the molar ratio of chromate to CPC but the CPC concentration in retentate. The relative flux decreased as CPC was concentrated in the retentate. At the higher CPC concentration, flux decreases linearly on a plot of flux versus log CPC concentration, which is a typical effect of concentration polarization. The gel concentration, that is important since it defines the practical limit of surfactant retentate concentration which can be filtered, of CPC was approximately 980mM.