

## Removal of anionic contaminants by ultrafiltration combined with cationic surfactant modified powdered activated carbon (PAC)

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It was investigated for removal of anionic contaminants in water to cationic surfactant modified powdered activated carbon (PAC) in dead-end ultrafiltration system. PAC was modified by Ceptylpyridinium chloride (CPC). In the experiment, water is artificially contaminated with arsenate ( $\text{H}_2\text{AsO}_4^-$ ), chromate ( $\text{CrO}_4^{2-}$ ) and ferricyanide ( $\text{Fe}(\text{CN})_6^{3-}$ ). Concentration of each contaminant is 0.3 mM. All the experiments were conducted in dead-end ultrafiltration at 1 bar. Without addition of modified PAC, removal efficiency of anionic contaminants is less than 20%. With 4 g/L of modified PAC, removal efficiencies of chromate and ferricyanide are enhanced from 20% to 100%. Monovalent arsenate showed 30% of removal efficiency, because of competition between contaminants. Although 4 g/L of modified PAC was used in ultrafiltration system, flux decline was not observed with time. And flux was kept approximately 3600 kg/m<sup>2</sup>h (LMH). Regeneration of spent PAC was conducted by using 5 M NaCl. 5 M NaCl can completely regenerate 4 g/L of spent PAC. And regenerated PAC showed similar performance to remove anionic contaminant as fresh modified PAC.