



## The effect of surfactant on dye removal by polyelectrolyte enhanced ultrafiltration

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### ABSTRACT

Polyelectrolyte-based separation of toxic dyes is studied to estimate the potential of polyelectrolyte enhanced ultrafiltration (PEUF) using polyethylene glycol (PEG). Removal of methyl orange (MO) an azo dye from aqueous solutions, by continuous polymer enhanced ultrafiltration (PEUF) was investigated. The permeate flux profile and obtained retention of MO were studied as a function of polyelectrolyte concentrations, transmembrane pressure, ionic strength and pH in the absence and in the presence of surfactant (CTAB). The experiments showed that retention of MO in the presence of PEG of different concentrations was 65%. This may be due to that the PEG polyelectrolyte cannot bind MO to form aggregates to enhance UF process. However, when the CTAB was applied at a fixed concentration below CMC, MO decolourization increased and reached a limiting value of 99%. The high rejection for MO dye is due to the formation of H aggregates in the aqueous solution. This result was confirmed by the change of the maximum absorption wavelength. The ionic strength and pH have no effect on the removal of MO in addition of CTAB. The permeate flux depended slightly on polyelectrolyte concentrations, transmembrane pressure, ionic strength and pH.

*Keywords:* Methyl orange; Polyethylene glycol; Surfactant; Ultrafiltration; PEUF

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