



## Integrated coagulation–ultrafiltration for enhanced removals of phosphate and organic in tertiary treatment

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### ABSTRACT

We have demonstrated an integrated coagulation–ultrafiltration (UF) process for enhanced removals of phosphate and dissolved organic carbon (DOC) in tertiary treatment. A lab scale system with hollow fiber UF membranes was used in the study. Dead-end operation was applied in the study since its advantages of low energy consumption and high water recovery over cross-flow operation. The results showed that removals of phosphate and DOC at alum dosage of 10 mg l<sup>-1</sup> in the study were >99% (or phosphate <0.03 mg l<sup>-1</sup> in product) and 25%, respectively. The coagulation time in the new integrated coagulation-UF process was reduced to 1 min with much less foot-print. The concentration of alum dose could be further optimized between 5 and 10 mg l<sup>-1</sup>.

*Keywords:* Tertiary treatment; Integrated process; Ultrafiltration; Phosphate removal; DOC; Coagulation

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