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ENHANCED EFFLUENT QUALITY OF MICROFILTRATION CERAMIC MEMBRANE BY PRE-ELECTROCOAGULATION

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To purge micro polluted surface water more effectively through microfiltration (MF) ceramic membrane, electrocoagulation (EC) was employed to improve the effluent quality of the ceramic membrane. Process variables such as current density, influent flux and filtering mode were investigated based on the single factor experiment analysis. The refined EC-MF operating parameters were a current density of 2.0 mA·cm^{-2}, an influent flow rate of 4 L·min^{-1} and cross flow filtration without recycling. Meanwhile, comparison of MF ceramic membrane performance with chemical-coagulation (CC) and electrocoagulation pretreatment was conducted. The results stated that conventional chemical coagulation was superior to aluminum based electrocoagulation and the gap in removal efficiency broaden with the escalation of Al^{3+} concentration since pre-CC had a higher removal rate of aromatic organic compounds.

Keywords: aromatic organic compounds, chemical coagulation, electrocoagulation, filtering mode, microfiltration ceramic membrane, micro polluted surface water.

Introduction

Membrane separation technology is known as a mixture material of separation, enrichment and purification process, which is driven by pressure or potential difference in the light of selectivity properties in different substances during membrane filtration. In the 1940s, ceramic membrane was initial used in the separation and purification of nuclear material [1]. Since then, a succession of pundits applied the seminal technique to various gamut of fields in virtue of its chemical stability, high mechanical strength, good antifouling properties and long life-span [2 – 5].

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