Removal of color caused by dissolved organic matter from groundwater by electroflotation-filtration continuous flow reactor and optimization by response surface methodology

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**ABSTRACT**

To decrease the color mainly caused by the dissolved organic matter (DOM) in underground water with low turbidity and high chromaticity, a coagulation and electroflotation-filtration process was proposed. The investigated operating parameters based on minimum residual color were coagulant type, dose, electrodes materials, filtering velocity, and current intensity. The electroflotation–filtration reactor was operated in the vertical continuous flow mode. The best coagulant was polymerization ferric chloride (PFC). Aluminum electrodes were selected as anodes by comparison experiments. The results indicated that the increase in filtering velocity resulted in decrease in color removal and shorter standard processing time with the aluminum electrode. When the current was below a certain value, increasing current intensity shortened the time to reach the minimum residual color and achieved higher color removal. The interaction between the factors and their optimum levels for minimum residual was determined using response surface methodology. The optimum operation conditions were the filtering velocity of 5.00 m/h, the PFC dosage of 36.07 mg/L, and current intensity of 2.00 A with aluminum electrode, and the minimum residual color of 4.52 Pt–Co units could be obtained.

**Keywords:** Continuous flow reactor; Dissolved organic matter; Electroflotation; Groundwater; Response surface methodology

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