Humic Acid Removal by Electrocoagulation Process from Natural Aqueous Environments

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Humic acid results in formation of highly toxic and carcinogenic byproducts during the disinfection process of water by chlorine. In this study, removal of industrial humic acid from artificial and natural aqueous media is investigated using electrocoagulation process. To reach the goal, first, humic acid-contaminated water samples with concentrations of 20 mg/L were prepared in a reactor with the effective volume of 1 L, equipped with iron electrodes. Then, the effects of pH (2 up to 9) and electric potential of 30 V was studied by measurement of UV radiation absorption and total organic materials methods, on the coagulation process in removal of humic acid within 80 min. According to the results of this study, the best efficiency in removal of humic acid was obtained as 92.69% by electrochemical process when the parameters were adjusted as; potential difference of 50 V, 80 min reaction time, pH 5, and electric conductivity of 3000 $\mu\text{S}/\text{cm}$. In the optimum condition, the efficiency of humic acid removal from natural water was obtained as 68.8%. The results indicated that, the electrochemical process equipped with iron electrodes could remove humic acid from aqueous media, efficiently.

Keywords: Humic Acid, Electrocoagulation process, Aqueous Environments, Natural Organic Material, Dissolved Organic Material

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