عنوان مقاله:

Humic acid removal from aqueous solutions by peroxi-electrocoagulation process

محل انتشار:

مجله مدیریت ومهندسی بهداشت محیط, دوره 2, شماره 2 (سال: 1394)

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خلاصه مقاله:

Background: Natural organic matter is the cause of many problems associated with water treatment such as the presence of disinfection by-products (DBPs) and membrane fouling during water filtration. In this study, the performance of the peroxi-electrocoagulation process (PEP) was investigated for the removal of humic acids (HAs) from aqueous solutions.Methods: PEP was carried out for the removal of HA using a plexiglas reactor with a volume of 2 L and fitted with iron electrodes and a direct current supply (DC). Samples were taken at various amounts of pH (2-4), current density (1 and 2A/cm2), hydrogen peroxide (50-150 mg/L) and reaction time (5-20 minutes) and then filtered to remove sludge formed during reaction. Finally, the HA concentration was measured by UV absorbance at 254 nm (UV254).Results: Results indicated that increasing the concentration of H2O2 from 50 to 150 mg/L increased HA removal efficiency from 83% to 94.5%. The highest removal efficiency was observed at pH 3.0; by increasing the pH to the alkaline range, the efficiency of the process was reduced. It was found that HA removal efficiency was high in current density 1A/cm2. Increasing current density up to 1 A cm-2 caused a decrease in removal efficiency. Results of this study showed that under the optimum operating range for the process ([current density] = 1A/cm2, [hydrogen peroxide concentration] = 150 mg/L, [reaction time]= 20 minutes and [pH]= 3.0), HA removal efficiency reached 98%.Conclusion: It can be concluded that PEP has the potential to be utilized for cost-effective removal of HA from .aqueous solutions

کلمات کلیدی:

Humic acid, Peroxi-electrocoagulation, Iron electrode, UV254, Water solutions