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Treatment of landscape water (LSW) by electrocoagulation process

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ABSTRACT

The aim of this study was to utilize an aluminum electrocoagulation for the removal of algae and dissolved organic matter from landscape water, which was taken from an artificial lake and mixed with NaCl stock solutions to make its final concentration in the range of 0.5–3 g/l. The removal efficiency of chlorophyll-*a*, UV_{254} and turbidity was investigated under different current densities, charge loadings, conductivities (689–4684 μs cm^{-1}) and pH values (3–11). The comparative removal performance together with sludge production by chemical coagulation and electrocoagulation were studied. With electrocoagulation, the optimal removal efficiencies of chlorophyll-*a* and UV_{254} were 81% and 56%, respectively, and the residual turbidity and sludge production were less than 2.6 NTU and 5.1% of the total solution (after 10 min sedimentation), respectively. In comparison, for chemical coagulation the optimum removals of chlorophyll-*a* and UV_{254} were 75% and 46%, respectively, and the residual turbidity and the sludge production were 3.6 NTU and 9.3% of the total solution (after 10 min sedimentation), respectively. The results demonstrated that electrocoagulation was an effective process for the removal of algae and dissolved organic matter from landscape water and exhibited advantages to chemical coagulation.

Keywords: Algae; Aluminum electrode; Chlorophyll-*a*; Chemical coagulation (CC); Dissolved organic matter (DOM); Electrocoagulation (EC); Landscape water

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