

Reduction of COD and TSS from Paper Industries Wastewater using Electro-Coagulation and Chemical Coagulation

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Abstract

The objective of the present study was to investigate experimentally the removal of total suspended solid (TSS) and chemical oxygen demand (COD) of wastewater from paper industries by electro-coagulation techniques solely, or with the aid of chemical flocculants. Electro-coagulation experiments were carried out using iron electrodes and either iron sulphate or calcium carbonate as chemical coagulants. A parametric study including the effect of the type of coagulant, initial pH, current density (CD), circulating flow rate, and electro-coagulation time, on the percent removals of TSS, and COD was considered to explore their role in improving the treatment performance. Without the aid of flocculants, electro-coagulation treatment was able to reduce TSS and COD concentrations up to 80%. In particular, electro-coagulation with the aid of iron sulphate or calcium carbonate as flocculants was found to have the highest removal levels that reach values in the range of 90–97%.

Keywords COD removal, Electro-coagulation, Fe electrode, TSS removal, Wastewater from paper industries