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ICEEM/03 – ENVIRONMENTAL ENGINEERING SECTION

Environmental Modelling, Simulation and Optimization

OPTIMIZATION STUDY OF A WASTEWATER CHEMICAL TREATMENT WITH PONILIT GT-2 ANIONIC POLYELECTROLYTE

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Abstract

This paper discusses the applications of synthetic PONILIT GT-2 anionic polyelectrolyte for chemical wastewater treatment. Synthetic wastewaters with different colloid concentrations were prepared and the flocculation process followed by sedimentation and/or filtration was studied. Variables concerning the chemical wastewater composition, temperature, mixing time, and flocculants dose are considered in order to appreciate the process efficiency (e.g., turbidity, color and organic matter removals). The removal degrees of turbidity and color are important (>80%) and, respectively, acceptable for organic matter expressed by Chemical Oxygen Demand (COD removal <45%). An empirical model was elaborated by a third order rotatable design 2^3 type, considering temperature, polyelectrolyte dose and mixing time as independent variables, while the turbidity and color removal efficiencies were chosen as optimization criteria. The mathematical model was found adequate for the chemical wastewater treatment. Also, an analysis of the model was performed to find the optimal operating conditions, in order to apply this process for efficient chemical wastewater treatment using PONILIT GT-2 anionic polyelectrolyte as flocculation agent.

Keywords: PONILIT GT-2 anionic polyelectrolyte, flocculation, turbidity, color, third order rotatable design 2^3 type

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