



Enhanced turbidity removal in water treatment by using emerging vegetal biopolymer composite: a characterization and optimization study

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ABSTRACT

There are many factors which affect flocculation process in water treatment process. In this study, it is hypothesized that physico-chemical properties such as molecular weight, functional groups, charge density, mixing speed, mixing time, sedimentation time, concentration of cation (Fe), and polymers (polyacrylamide (PAM) and pectin) added, and pH of water influence treatment capability. The treatment is carried out using conventional coagulation–flocculation (two stage mixing mode). Secondly, coag–flocculation (one stage mixing mode) is carried out where a composite of Fe–PAM or Fe–pectin is added. The result suggests that coag–flocculation process is favorable for treating turbid wastewater. Furthermore, pH and concentration of Fe–PAM or Fe–pectin affect treatment process. Unlike Fe–pectin, mixing speed is a significant factor when using Fe–PAM. Moreover, Fe–PAM requires a higher mixing speed, higher pH and lower concentration added than that of Fe–pectin. Considering the importance for energy conservation worldwide, composite Fe–pectin is preferable as it uses less energy.

Keywords: Biodegradation; Coag–flocculation; PAM; Pectin; Photodegradation; Thermal degradation

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