

A preliminary study on *Jatropha curcas* as coagulant in wastewater treatment

ABSTRACT

Many coagulants, mainly inorganic, are widely used in conventional water and wastewater treatment. Recent studies reported the occurrence of some chronic diseases associated with residual coagulant in treated wastewater. The use of alternative coagulants which are biodegradable and environmentally friendly could alleviate the problem associated with these diseases. This work investigates the capability of *Jatropha curcas* seed and presscake (the residue left after oil extraction) to reduce the turbidity of wastewater through coagulation. The coagulant was prepared by dissolving *Jatropha curcas* seed and presscake powder into solution. Then jar tests were conducted on kaolin solution as the model wastewater. The *Jatropha* seed was found to be an effective coagulant with more than 96% of turbidity removal at pH 163 and pH 11612. The highest turbidity removal was recorded at pH 3 using a dosage of 120 mg/L. The flocs formed using *Jatropha* were observed to be bigger and to sediment faster when compared with flocs formed using alum. The turbidity removal was high (>98%) at all turbidities (100 NTU to 8000 NTU), suggesting its suitability for a wide range of industrial wastewater. The performance of *Jatropha* presscake after extraction of oil was also comparable to the fresh seed and alum at highly acidic and highly alkaline conditions. The addition of *Jatropha* did not significantly affect the pH of the kaolin samples after treatment and the sludge volume produced was less in comparison to alum. These results strongly support the use of *Jatropha curcas* seed and presscake as a potential coagulant agent.

Keyword: Coagulant; Coagulation; *Jatropha*; Wastewater