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A sustainable approach for the treatment of industrial effluent using a green coagulant *Cassia fistula* vs. chemical coagulant

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ABSTRACT

The presence of contaminants in the paint industry effluent confirms the necessity of its treatment before disposal. This study aims to assess the potentiality of green coagulant *Cassia fistula* by treating it against the synthetic paint industry wastewater. The process of coagulation was done using standard jar test apparatus. The operational variables like solvent type (NaCl, KCl, and distilled water), solvent concentration (1–5 N), coagulant dosage (1–10 g/L), coagulant-extract volume (40–240 mL/L), initial pH (5–11), and initial concentration (1,200; 1,350; 1,850; 2,200; and 2,700 mg/L) had been varied. The recommended condition to treat a liter of effluent was 160 mL of coagulant extract prepared using 5 g of *C. fistula* and 2 N NaCl, at its initial pH (7.8–8.4). The settling studies were conducted to evaluate the sludge volume index, hindered settling velocity, and sludge weight. The obtained results of *C. fistula* is compared with the chemical coagulant ferrous sulfate. The results acknowledged that *C. fistula*, a natural, eco-friendly, green coagulant, could be a strong alternative to the chemical coagulant in the treatment of paint industry wastewater.

Keywords: Synthetic paint industry wastewater; *Cassia fistula;* Coagulation; Settling; Floc

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