Modelling the kinetics of coagulation process for tannery industry effluent treatment using *Moringa oleifera* seeds protein

Marichamy Magesh Kumar\textsuperscript{a,}\textsuperscript{*}, Ramasamy Karthikeyan\textsuperscript{b}

\textsuperscript{a}Department of Chemical Engineering, School of Bio Engineering, SRM University, Kattankulathur 603 203, Tamil Nadu, India, Tel. +91 9940585262; email: mmagesh23@gmail.com
\textsuperscript{b}Department of Chemical Engineering, Anjalai Ammal Mahalingam Engineering College, Kovilvenni, Thiruvarur, Tamil Nadu, India, Tel. +91 9940561915; email: drrkarthi@yahoo.com

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**ABSTRACT**

The ability of the natural coagulant extracted from *Moringa oleifera* seeds to remove the turbidity from tannery industry wastewater was studied. Coagulation experiments were performed using conventional jar test apparatus with 4–9 pH range and coagulant dose ranging from 10 to 50 mL. The active coagulation component of *M. oleifera* seed was prepared separately using NaCl and KCl salt solutions. Turbidity removal efficiency of NaCl-extracted coagulant and KCl-extracted coagulant was compared. The turbidity of raw tannery wastewater was reduced from 121.9 to 29.01 mg/L at an optimum pH 7 and coagulant dosage of 40 mL. The maximum turbidity removal efficiency was observed as 76.2 and 71.2% for NaCl- and KCl-extracted coagulants, respectively. The coagulation kinetic study suggested that the process follows second-order kinetics for both type coagulants, and the parameters for rate equation were obtained from the regression equations.

**Keywords:** Tannery industry wastewater; *Moringa oleifera* coagulant (MOC); Turbidity removal; Coagulation kinetics; Particle size distribution

\textsuperscript{*}Corresponding author.