Evaluation of wasted biomaterial, crab shells (*Portunus sanguinolentus*), as a coagulant, in paint effluent treatment

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**ABSTRACT**

The ability of the wasted biomaterial crab shells, *Portunus sanguinolentus*, as a coagulant, in the treatment of simulated water-based paint industry effluent was evaluated. The treatment process was conducted in conventional jar test. The FTIR spectrum values endorse the existence of chitosan in *P. sanguinolentus*. The leverage of variables such as time (min), eluent type (deionized water, NaCl, and BaCl₂), eluent concentration (1–5 N), coagulant dose (1–6 g), coagulant volume (20–100 mL), initial pH (5–10), and initial concentration (3,100, 4,224, 5,650, 6,258, and 7,693 mg/L named as sample number 1–5, respectively) were investigated in terms of color, chemical oxygen demand, and turbidity. The optimized value of the above-mentioned variables were examined and the values are 20 min of slow mixing, 15 min of settling course, 3 N NaCl as an eluent, and 100 mL of 3 g crab shells eluate to treat 1 L of effluent under basic pH. The maximum removal efficiency was identified for higher initial concentration effluent, sample 5. The results were compared with conventional coagulant alum and ferric chloride from previous studies. The wasted biomaterial crab shells could act as propitious surrogate for conventional coagulants.

*Keywords: Portunus sanguinolentus; Crab shell; Paint effluent; Coagulation; Eluate*