



Adsorption of organic pollutants from slaughterhouse wastewater using powder of *Moringa oleifera* seeds as a natural coagulant

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ABSTRACT

The seed of *Moringa oleifera* Lam. (*Moringaceae*) comes from a tropical plant containing important quantities of edible oils and water-soluble proteins with excellent coagulation properties which can be used in wastewater treatment. These proteins are non-toxic natural organic polymers and biodegradable. The main objective of this work was to use the powder of seeds of *M. oleifera* Lam. as a natural coagulant for the adsorption of organic pollutants from slaughterhouse wastewater. The effects of adsorption time, initial pH, slaughterhouse wastewater concentration and dosage of seed in powder were evaluated. The results indicated that 180 min is necessary for a high adsorption. The greatest removal efficiency measured as chemical oxygen demand (COD) was 5,614 mg/L (64%) and this was reached using 7 g/L powder of seed, pH 9 and 8,772 mg/L of pollutant in wastewater. This study elucidates that the sorption process follows second-order kinetics and the values of constant are in the range $0.0427 \leq k_2$ (g pollutant organic adsorbed/g of *M. oleifera* min) ≤ 0.0516 , with correlation coefficients above 0.98. The adsorption data were fitted to the Langmuir and Freundlich isotherm equations. The maximum adsorption capacity of 0.523 g COD/g powder suggests a good affinity between the organic pollutants and the powder.

Keywords: *Moringa oleifera*; Slaughterhouse wastewater; Natural coagulant; Bioadsorbent

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