

**CHITOSAN COATED OIL PALM TRUNK TO REMOVE MALACHITE
GREEN**

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ABSTRACT

Chitosan-coated oil palm trunk (CSOPT) was prepared as an adsorbent by coating chitosan (CS) on the oil palm trunk (OPT). CSOPT acts as a low-cost adsorbent for the batch adsorptive removal of malachite green (MG) from synthetic dye solutions. The structural and morphological properties of the produced CSOPT adsorbent were investigated using SEM and FTIR spectrometers. The effects of pH (3 to 8), adsorbent dosage (0.02 to 0.10 g/L), initial dye concentration (5 to 70 mg/L), and adsorbent contact time (3 to 60 minutes) on adsorption were investigated. FTIR spectroscopy confirms the adsorption of MG on the CSOPT. In addition, several mathematical equations were used to represent isotherms and kinetics studies. The Langmuir isotherm model and pseudo-second-order kinetic model match the experimental data well, with $R^2 = 0.90$ and 0.99 , respectively. The maximal adsorption capacity of acid-treated coffee husk was measured to be 40.325 mg/g. The optimum conditions of MG dye adsorption obtained were at pH 6, 60 minutes, 0.01 g and 298 K. This study demonstrates that CSOPT is a viable and efficient, low-cost adsorbent for the removal of MG from industrial effluent and used for wastewater treatment.