

**ADSORPTION OF MALACHITE GREEN ONTO TREATED
LALANG (*Imperata cylindrica*) POWDER**

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ABSTRACT

ADSORPTION OF MALACHITE GREEN ONTO CHEMICALLY TREATED LALANG (*Imperata cylindrica*) POWDER

Adsorbent prepared from lalang (*Imperata cylindrica*) leaf- a low cost adsorbent were used for removal of malachite green (MG) from aqueous solution. The adsorbent is sulphuric acid-treated *Imperata cylindrica* powder (SICP). The adsorbent materials were characterized by Fourier transform infrared (FTIR) spectroscopy. FTIR analysis showed that a large number of carbonyl and hydroxyl groups presence on the surface of SICP. Batch experiments were conducted to investigate the various parameters with respect to the pH_{zpc} , initial dye concentrations, solution pH, and adsorbent dosage. The pH_{zpc} of SICP was determined to be 6.90 in which the adsorption of malachite green that considered as cationic dye was favorable. For kinetic adsorption studied, pseudo-first order and pseudo-second order were applied. Based on the result, it showed that kinetic studies were perfectly represented by pseudo-second-order kinetic model, suggesting that the adsorption might be physisorption process. The Langmuir and Freundlich isotherms models were employed in order to investigate the adsorption behavior of SICP and it followed the Langmuir isotherm model compared to the Freundlich isotherm model. So, it shows that adsorption process was monolayer with the coverage of the MG molecule only takes place at the outer surface of SICP. The maximum adsorption capacity (q_{max}) was found to be 92.51 mg g^{-1} at pH 7, shaking speed of 120 rpm and at temperature at 303 K.