

## Papaya (*Carica papaya* L.) Leaf Powder: Novel Adsorbent for Removal of Methylene Blue from Aqueous Solution

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### ABSTRACT

Batch sorption experiments were carried out to investigate the potentiality of papaya leaf powder (PLP) for the removal of methylene blue (MB) from aqueous solution. The effects of various experimental parameters, such as adsorbent dose, initial solution concentration, contact time, and solution pH were also studied. The amount of dye adsorbed was found to increase with increase in initial dye concentrations. Papaya leaf adsorbs MB better in basic medium. The adsorption equilibrium data fitted well in the Langmuir isotherm equation with a monolayer sorption capacity of 512.55 mg g<sup>-1</sup>. The kinetics of MB adsorption onto papaya leaf was examined using the pseudo-first and pseudo-second order and unified approach kinetic models. The adsorption kinetics followed the pseudo-second order kinetic model, but the rate constant was found to depend on initial dye concentration. The unified approach model described the equilibrium and kinetics well. The forward and backward rate constants were determined from the unified approach model.

**KEYWORDS:** *Carica papaya*; Methylene blue; Adsorption; Kinetics; Isotherm

**DOI:** [10.1007/s11270-012-1249-7](https://doi.org/10.1007/s11270-012-1249-7)