



## Removal of Methylene blue Dye by Adsorption onto Activated Carbon from *Adenanthera pavonina L* Seeds

P. Ashokan\* and M. Asaithambi

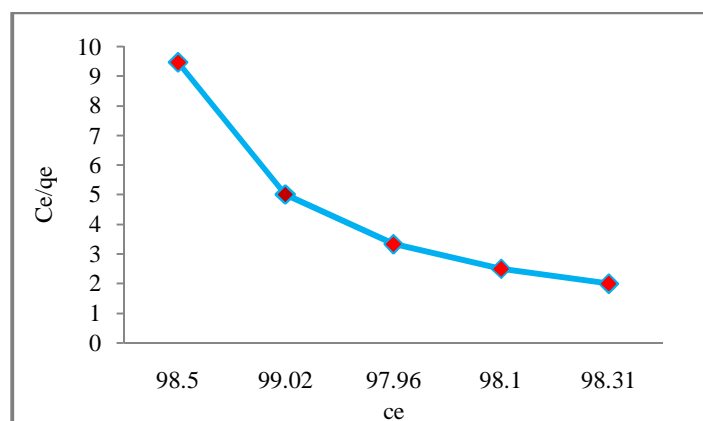
Department of Chemistry, Erode Arts College, Erode, Tamil Nadu, **INDIA**  
Email: [ashokanmsc@gmail.com](mailto:ashokanmsc@gmail.com)

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### ABSTRACT

Activated carbon has been extensively used as an active adsorbent for removing impurities from the water stream. Preparation of activated carbon using agricultural by-products is ecologically friendly and can significantly contribute to the virtuous cycle of natural polymers. In this study, removal of Methylene blue from aqueous solutions is studied using an *Adenanthera pavonina L* seeds sample as a low-cost adsorbent. The effects of pH, contact time and dye concentration is taken into consideration. The adsorption kinetics results are adjusted to best fit the pseudo-second-order model. The experimental data are analyzed by Langmuir isotherms and Freundlich isotherms, revealing that the maximum adsorption capacity of methylene blue on this *Adenanthera pavonina* activated carbon sample equals  $49.55 \text{ mg g}^{-1}$  at 60 min. From these results, it can be considered that the *Adenanthera pavonina* activated carbon sample tested herein is effective in the removal of methylene blue from aqueous solutions and moreover may be used as an alternative to high-cost commercial adsorbents.

### Graphical Abstract



Langmuir adsorption isotherm of methylene blue into *Adenanthera pavonina* activated carbon.

**Keywords:** Activated carbon, *Adenanthera pavonina L* seeds, Batch adsorption, Methylene blue, Synthetic dyes.