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Enhanced removal of methyl violet using NaOH-modified *C. camphora* leaves powder and its renewable adsorption

Yufang Tang[a,*], Yunyun Li[a], Yuemei Zhao[a], Qiang Zhou[a], Yongzhen Peng[b]

[a]*College of Chemical Engineering, Xiangtan University, Xiangtan 411105, China, Tel. +86 731 58298172, Fax +86 731 58298172, email: tyfchky@126.com (Y. Tang), 478604467@qq.com (Y. Li), 575943279@qq.com (Y. Zhao), 919542943@qq.com (Q. Zhou)*
[b]*Key Laboratory of Beijing for Water Quality Science and Water Environment Recovery Engineering, Beijing University of Technology, Beijing 100124, China, email: pyz@bjut.edu.cn (Y. Peng)*

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ABSTRACT

In this study, the enhanced removal of cationic dye, methyl violet (MV), from aqueous solution with NaOH-modified *C. camphora* leaves powder (N-CLP), compared with *C. camphora* leaves powder (CLP), was demonstrated. Subsequently, the effects of solution pH, initial MV concentration, contact time, and temperature on the adsorption of MV by N-CLP were systematically studied. The experimental results showed that MV adsorption on N-CLP was pH-dependent and stable adsorption could be achieved at pH 4.0–10.0. Electrostatic adsorption and π–π stacking could be involved in adsorption. The adsorption process for MV on N-CLP followed pseudo-second-order kinetics model. Equilibrium adsorption data were well fitted to the Langmuir isotherm model. The adsorption process is endothermic, spontaneous and random. The adsorption property of second-regenerated N-CLP and third-regenerated N-CLP still had 0.85 times over that of N-CLP and the N-CLP could be used as a renewable bio-adsorbent for removal the refractory pollutants in wastewater.

Keywords: NaOH-modified *C. camphora* leaves powder; Adsorption; Adsorbent; Methyl violet

*Corresponding author.