



## Removal of cationic dyes from aqueous solutions by a low-cost biosorbent: longan shell

Shengfang Li<sup>a,b,\*</sup>, Min Tao<sup>b</sup>

<sup>a</sup>*School of Chemistry and Chemical Engineering, Hubei Polytechnic University, Huangshi 435003, P.R. China, Tel./Fax: +86 714 6367957; email: lishengf\_@163.com*

<sup>b</sup>*Hubei Key Laboratory of Mine Environmental Pollution Control and Remediation, Hubei Polytechnic University, Huangshi 435003, P.R. China*

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### ABSTRACT

Longan shell was investigated as a low-cost biosorbent for fast removal of two cationic dyes such as basic magenta (BM) and methylene blue (MB) from aqueous solution. Various factors affecting the biosorption, like initial pH of solution, biosorbent dosage, particle size, contact time and dye concentration were studied. When the initial pH of solution increased from 2.2 to 5.5, the uptake of cationic dyes at equilibration time ( $q_e$ ) also increased. For BM and MB,  $q_e$  decreased from 33.45, 38.32 to 3.22, 4.63 mg/g with the increase of longan shell dosage. Additionally,  $q_e$  slightly increased with a decrease of longan shell particle size from 40–60 mesh to 80–100 mesh (i.e. for BM,  $q_e$  increased from 29.61 to 33.45 mg/g; and for MB,  $q_e$  increased from 32.83 to 38.45 mg/g, respectively). It was found that the biosorption process followed the pseudo-second-order kinetics and the biosorption isotherm agreed with Langmuir model. The results indicated that powdered longan shell was a promising biosorbent for rapid removal of cationic dyes from aqueous solution.

*Keywords:* Biosorption; Longan shell; Cationic dye; Kinetics; Isotherm

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\*Corresponding author.