



## Preparation and application of thiol wheat straw as sorbent for removing mercury ion from aqueous solution

Renmin Gong<sup>a\*</sup>, Wenkai Cai<sup>a</sup>, Na Li<sup>a</sup>, Jian Chen<sup>b</sup>, Jingjing Liang<sup>a</sup>, Jinxiu Cao<sup>a</sup>

<sup>a</sup>Faculty of Biochemistry, School of Life Science, Anhui Normal University, Wuhu, 241000, P R China

<sup>b</sup>School of Biotechnology, Southern Yangtze University, Wuxi, 214036, P R China

Tel. +86 55 33345968; email: renmin.gong@yahoo.com

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### ABSTRACT

In this paper, thiol wheat straw (TWS) was prepared by esterifying mercaptoacetic acid onto cellulose in wheat straw. The potential feasibility of TWS as sorbent for removing mercury ion from aqueous solution was investigated in a batch system. The Hg<sup>2+</sup> removal was found to be dependent on initial pH, sorbent dose, Hg<sup>2+</sup> concentration, contact time, and temperature. The maximum value of Hg<sup>2+</sup> removal appeared in the range of pH 4 to 7. The isothermal data of Hg<sup>2+</sup> sorption conformed well to the Langmuir model and the maximum sorption capacity ( $Q_m$ ) of TWS for Hg<sup>2+</sup> was 72.46 mg/g. The equilibrium of Hg<sup>2+</sup> removal was reached within 100 min. The Hg<sup>2+</sup> removal process could be described by the pseudo-first-order kinetic model. The thermodynamic study indicated that the Hg<sup>2+</sup> removal process was spontaneous and exothermic.

*Keywords:* Removal; Mercury ion; Esterification; Mercaptoacetic acid; Wheat straw

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\* Corresponding author.