Biosorption of heavy metals: a case study using potato peel waste

Yong Sun, Gang Yang, Lian Zhang

Edith Cowan University, School of Engineering, 270 Joondalup Drive Joondalup WA 6027, Australia, Tel. +61 08 63045931, email: y.sun@ecu.edu.au, ysunippecas@gmail.com (Y. Sun)

National Engineering Laboratory of Cleaner Production Technology, Institute of Process Engineering, Chinese Academy of Sciences, Beijing, 100190, China, Tel. +86 01 82661863, email: gangyangippecas@gmail.com (G. Yang)

Monash University Department of Chemical Engineering, VIC Australia, 3800, Tel. +61 0399052592, email: lian.zhang@monash.edu.au (L. Zhang)

Received 9 February 2017; Accepted 25 June 2017

ABSTRACT

Potato peel waste (PPW) from food processing was used for removing As^{3+}, Pb^{2+}, and Hg^{2+} heavy metals from water. The response surface methodology (RSM) and the central composite design (CCD) were employed for determining optimal conditions for heavy metal removal. The statistical analysis indicates that the effect of pH is the most significant parameter. The optimal condition for achieving the maximum removal was obtained for removing different metals using RSM. Desorption study indicates its good reusability within three recycling steps.

Keywords: Biosorption; Central composite design; Response surface methodology; Heavy metal

*Corresponding author.