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# Removal of boron from aqueous solution by ion exchange resin LSC–800: Batch and column studies

Jinming Duan[a,*], Yaru Zhao[a], Hongda Fang[a], Zhaoji Zhang[b], Jinfang Chen[a], Jinmei Lin[a], Jinqiang Dong[a]

[a]*Department of Environmental Engineering, School of Food and Biological Engineering, Jimei University, Xiamen, 361021, China, Tel. +86 592 6180470, Fax +86 592 6180470, email: duanjinming@jmu.edu.cn (J. Duan), 984015794@qq.com (Y. Zhao), hongdafang@126.com (H. Fang), jfchen@ jmu.edu.cn (J. Chen), jmlin@ jmu.edu.cn (J. Lin), 2857183711@qq.com (J. Dong)*
[b]*Key Laboratory of Urban Pollutant Conversion, Chinese Academy of Sciences, Xiamen, 361021, China, email: zjzhang@iue.ac.cn*

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**ABSTRACT**

In this work, both batch and column experiments were performed to investigate on boron removal from aqueous solution by LSC–800 ion exchange resin. The effects of contact time, initial pH, resin dosage, temperature, initial boron concentration and foreign ions on boron removal were studied, and the kinetics, equilibrium and thermodynamic data of the adsorption process were evaluated. The results showed that the contact time was 120 min to reach adsorption equilibrium, and the kinetic experimental data were best described by pseudo-second-order model. The boron removal depends on the resin dosage and solution pH, and the maximum boron removal was obtained at pH 9. The amount of boron removal increased as temperature and initial boron concentration increased. There is no essential effect of NaCl, $CaCl_2$ and $MgSO_4$ on boron removal. The Langmuir isotherm model agrees well with the equilibrium experimental data. The thermodynamic parameters indicated that the boron adsorption process was a spontaneous and endothermic. The resin can be reused frequently. The column capacity value of the resin was obtained by graphical integration as 31.04 mg/g. Both the Thomas and Yoon-Nelson models fitted well with the column studies' data.

*Keywords:* Boron; Ion exchange; Adsorption; Resin LSC-800; Isotherm; Kinetics

*Corresponding author.