Desalination and Water Treatment
www.deswater.com

doi: 10.5004/dwt.2019.24110

159 (2019) 193–199
August

Crosslinked amino starch prepared via a dry process and its decoloration performance of Congo Red

Lei Guo*, Kaijin Jin, Yuanchao Cao, Guiying Li, Junshen Liu

School of Chemistry and Materials Science, Ludong University, Yantai 264025, China, Tel. +86-535-6672176; Fax: +86-535-6696162; emails: unikguo@gmail.com (L. Guo), 1047678508@qq.com (K. Jin), 1076197425@qq.com (Y. Cao), 26362442@qq.com (G. Li), xincaihuanbao@qq.com (J. Liu)

Received 30 October 2018; Accepted 8 March 2019

ABSTRACT

Three types of crosslinked amino starch (CAS) were prepared via a dry process by using monomethylamine, dimethylamine and trimethylamine as materials, respectively. The effect of material ratio on the nitrogen content of CAS was investigated. CASs were characterized by scanning electron microscopy and Fourier-transform infrared spectroscopy. The decoloration performance of Congo Red in the aqueous solution by CASs was also studied. With the aim to understand the adsorption mechanism and evaluate the maximum adsorption capacity, the adsorption equilibrium data were analyzed by Langmuir, Freundlich and Sips models. The isotherm data fits the Sips model better than the others. The maximum adsorption capacities of crosslinked monomethylamine starch, crosslinked dimethylamine starch and crosslinked trimethylamine starch are 363.09, 243.62 and 358.46 mg/g, respectively.

Keywords: Crosslinked amino starch; Dry process; Decoloration; Congo red; Isotherm

* Corresponding author.