

Accepted Manuscript

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Chengmei Shi, Furong Tao, Yuezhi Cui



PII: S0141-8130(18)30570-1
DOI: [doi:10.1016/j.ijbiomac.2018.03.146](https://doi.org/10.1016/j.ijbiomac.2018.03.146)
Reference: BIOMAC 9368

To appear in:

Received date: 2 February 2018
Revised date: 17 March 2018
Accepted date: 24 March 2018

Please cite this article as: Chengmei Shi, Furong Tao, Yuezhi Cui , Evaluation of nitriloacetic acid modified cellulose film on adsorption of methylene blue. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. *Biomac*(2017), doi:[10.1016/j.ijbiomac.2018.03.146](https://doi.org/10.1016/j.ijbiomac.2018.03.146)

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Evaluation of nitriloacetic acid modified cellulose film on adsorption of methylene blue

Chengmei Shi, Furong Tao*, Yuezhi Cui

Shandong Provincial Key Laboratory of Fine Chemicals, Qilu University of Technology (Shandong Academy of Sciences), Jinan 250353, China

Tel: +86 531 89631208; Fax: +86 531 89631760;

E-mail address: frtao2015@126.com

Abstract

A novel composite film (MC α N) based on microcrystalline cellulose (MCC) and nitrilotriacetic acid anhydride (NTAA) was prepared via casting method for the adsorption of methylene blue (MB) from aqueous solution. FT-IR, XRD, elemental analysis and TGA analysis demonstrated the success of modification. The swelling behavior, mechanical properties and MB adsorption performance of the modified MC α N films were improved obviously. The recycling study illustrated that MC2N film could be recycled and exhibited constant adsorption performance for five successful runs. In addition, mechanism study found that adsorption behavior of the composite films was better consistent with the pseudo-second order kinetic model and the Langmuir model. All the results suggested that the MC α N films could be considered as a promising candidate for dye wastewater treatment.

Keywords: Microcrystalline cellulose; Nitrilotriacetic acid anhydride; Adsorption; Methylene blue; Recycling; Isotherm.

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