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

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

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Abstract

A novel composite film (MCαN) 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 MCαN 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 MCαN films could be considered as a promising candidate for dye wastewater treatment.

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