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Fabricating Anti-Counterfeiting Films by Grafting Cationic Dye on Cellulose Nanofiber

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Abstract : A facile and robust strategy is required to fabricate films with high special optical properties for application in the field of anti-counterfeit marking. Nanocellulose, derived from bioresources, is a renewable material with broad application prospects. In this paper, a method for grafting the eco-friendly Berberine cationic dye on cellulose nanofiber is proposed. A functional modification was carried out by in-situ polymerization along with a grafting approach with acrylic acid(AA) in order to develop cationic dyeability of the cellulose nanofiber (CNF). The Berberine grafting on nanocellulose was significantly influenced by the reaction time and temperature during the dyeing process. The dyed CNF-films exhibited appropriate characteristics like appearance, color strength, and fastness for anti-counterfeiting application.

Keywords : Cellulose nanofiber, Berberine, Grafting, anti-counterfeiting, film
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