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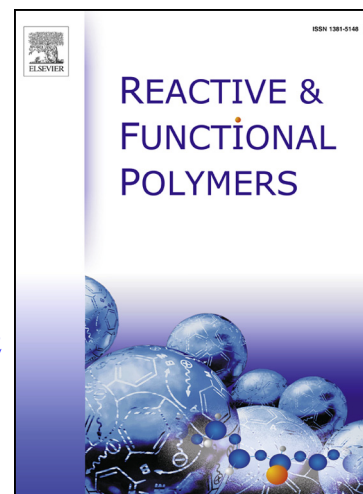
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Preparation of Cellulose-Based Conductive Hydrogels with Ionic Liquid

Xiangtao Liang^a, Bing Qu^a, Junrong Li^a, Huining Xiao^{b,*}, Beihai He^a, Liying

Qian^{a,**}

^aState Key Laboratory of Pulp and Paper Engineering, South China University of Technology, Guangzhou 510640, China

^bDepartment of Chemical Engineering, University of New Brunswick, Fredericton, New Brunswick, E3B 5A3, Canada

* Corresponding author. Tel.: +1 506 453 3532; fax: +1 506 453 3591.

** Corresponding author. Tel.: +86 20 87111770; fax: +86 20 87111770.

Email address: hxiao@unb.ca (H. Xiao), lyqian@scut.edu.cn (L. Qian)

Abstract: Conductive hydrogel composed of microcrystalline cellulose (MCC) and polypyrrole (PPy) was prepared in ionic liquid; and the resulting hydrogel was characterized with FT-IR, SEM, XRD and TGA. By doping with TsONa, the MCC/PPy composite hydrogels showed relatively high electrical conductivity, up to $7.83 \times 10^{-3} \text{ S} \cdot \text{cm}^{-1}$, measured using a four-probe method. The swelling kinetics of the composite hydrogels indicated that the swelling process was mainly influenced by the cellulose content; and the equilibrium swelling ratio decreased as the increasing of MCC content in the hydrogels. In addition, the MCC/PPy composite hydrogels exhibited significantly enhanced mechanical property in contrast to MCC hydrogel.

Keywords: conductive hydrogel; cellulose; polypyrrole; swelling; mechanical property

1 Introduction

Hydrogel is a kind of crosslinked and water-swelling polymer with a three-dimensional network structure. Its main chain or branched chain contains a large number of hydrophilic groups [1]. In recent years, the intelligent hydrogels which can

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