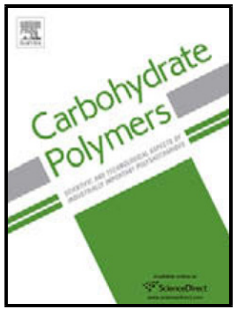

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Mixtures of ionic liquids as more efficient media for cellulose dissolution

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Highlights

- The ability of ionic liquids eutectic mixture to dissolve cellulose was studied.
- Addition of DMSO to the ionic liquid mixture improves the cellulose dissolution.
- Up to 43 g of cellulose per 100 g of used solvent mixture could be dissolved.
- Anisotropy was observed in the solutions with highest cellulose concentration.
- The dissolved cellulose could be easily reconstituted from the solutions.
- The IR spectroscopy can be used to assess the purity of the regenerated cellulose.

Abstract

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The ability to dissolve cellulose, by using mixtures of ionic liquids, has been studied and compared with results obtained for the corresponding single ionic liquids. The ionic liquid mixtures tested were a 3:7 mol/mol mixture of 1-ethyl-3-methylimidazolium chloride ([C_2mim]Cl) and 1-ethyl-3-methylimidazolium acetate ([C_2mim][OAc]), and the eutectic mixture (i.e., a 5.1:4.9 mol/mol ratio) of [C_2mim]Cl and 1-butyl-3-methylimidazolium chloride (C_4mim]Cl). The amount of dissolved cellulose was investigated at three different temperatures (323, 348, and 373 K) for each system. The greatest amount of dissolved cellulose was obtained