

Solubility of Cellulose and Wood in Ionic Liquids

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Wood cellulose is the most abundant bio-polymer on earth. Due to its renewability and zero carbon footprint it represents an environmentally friendly bio-resource for technological applications and a useful substitute of some fossil fuel based products. The search for cellulose solvents with low environmental impact and easy handling properties is ongoing. Promising candidates for this purpose were recently found within ionic liquids. They share distinctive physical properties like negligible low vapor pressure and non-flammability, but otherwise their physical and chemical behavior can vary considerably and tailored for specific applications. In order to design new ionic liquids with improved cellulose dissolving power, it is necessary to understand the influence of the structural features of their anions and cations on both their physical properties and their interactions with bio-polymers. A brief survey of the published literature data on ionic liquids with particular emphasis on their capacity to dissolve cellulose will be presented along with a summary of relationship between dissolving ability and the structure of the anions and cations. Some new results on the solubility of cellulose and wood in some promising ionic liquids will be presented.