

Rheology and dissolution of cellulose in ionic liquid solutions

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Abstract

In this study, ionic liquid based on pyridinium was synthesized, characterized and investigated as a dispersing solvent for microcrystalline cellulose (MCC). MCC /ionic liquids (ILs) solutions were then prepared at different concentrations (0.25, 0.5, 1, 2, 5 and 10 %wt) and characterized in terms of rheological properties. Following that, the viscosity of MCC/IL solutions was measured with an advanced rheometer in steady shear flow at various temperatures (20 - 80 °C). Regardless of temperature, the MCC / IL solutions behave like Newtonian fluids, indicating the high dispersion of the MCC colloids. The MCC/ILs solutions exhibited shear thinning behaviour at low shear rates once the concentration reached 2% wt. This finding indicates that pyridinium-based synthesized ionic liquids can be used as a cellulosic matter solvent.