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Chitin Crystalline Phase Transition Promoted by Deep Eutectic Solvent

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Abstract : Chitin films were prepared using alpha-chitin from shrimp shells as raw material and a simple method of precipitation-evaporation. Choline chloride: urea Deep Eutectic Solvent (DES) was used to disperse chitin and compared against hexafluoroisopropanol (HFIP). A careful analysis of the chemical and crystalline structure was followed along the synthesis of the films, revealing crystalline-phase transitions. The full conversion of alpha- to beta-, or alpha- to gamma-chitin structure were detected by XRD and NMR on the films. The synthesis of highly crystalline monophasic gamma-chitin films was achieved using a DES; whereas HFIP helps to promote the beta-phase. These results are encouraging to continue in the study of DES as good processing media to control the final properties of chitin based materials.

Keywords : chitin, deep eutectic solvent, polymorph, phase transformation
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