

Influence of [Emim][OAc] and Water on Gelatinization Process and Interactions with Starch

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Abstract : Thermoplastic starch (TPS) plasticized by 1-ethyl-3-methylimidazolium acetate [Emim][OAc] were obtained through gelatinization process. The gelatinization process occurred in the presence of water and [Emim][OAc] as plasticizer at high temperature (90°C). The influence of [Emim][OAc] and water on the gelatinization and interactions with starch have been studied over a range of compositions. The homogenous mass was obtained for the samples containing 35, 40 and 43.5 % of water contents which showed that water plays important role in gelatinization process. Detailed IR spectroscopy analysis showed decrease in hydrogen bonding intensity and strong interaction between acetate anion in [Emim][OAc] and starch hydroxyl groups in the presence of [Emim][OAc]. Starch-[Emim][OAc]-water mixture at 10-3-8.7 presented homogenous mass, less hydrogen bonding intensity and strong interaction between acetate anion in [Emim][OAc] and starch hydroxyl groups.

Keywords : starch, ionic liquid, 1-ethyl-3-methylimidazolium acetate, plasticizer, gelatinization, IR spectroscopy

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