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Preparation and Characterization of Starch-based Composite Films Reinfoced by Polysaccharide-based Crystals

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Abstract:

Starch based films,reinforced by two types of polysaccharide-based crystals,were prepared and compared. The films weretransparentand theirsurface was smooth in appearance. Addition ofcrystals increased the Young's modulus and tensile strength of starch-based materials and decreased elongation at break. Scanning electron microscopic observation indicatedgood compatibility between starch matrix and the reinforcingfillersdue to same chemical unit (glucose). Cellulose crystals havehigher thermal stabilitythan that of starch crystals;this provides better processibility and superiormechanical propertiesto starch films filled with cellulose crystals. On the other hand, starch films filled with starch crystals demonstratedhigherprotection againstUV radiation. Since all the components used in this work belong to food sources, the prepared films arebiodegradable, safe for food packaging and can also be used to