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Soluble soybean polysaccharide/TiO₂ bionanocomposite film for food application

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Highlights

- The migration of Ti might not occur from SSPS/TiO₂ film surface into bread (food model)
- The crystalline structure of the Ti was not affected with addition to polysaccharide matrix.
- nanocomposites containing 1 to 3% TiO₂ had a uniform morphology

Abstract

In the current study, a set of biodegradable soybean polysaccharide (SSPS) nanocomposites containing different ratios of TiO₂ nanoparticles was characterized as new packaging system. X-ray diffraction (XRD) measurement showed that the crystalline structure of the TiO₂ nanoparticles remained intact in the polysaccharide matrix and the surface of nanocomposites containing 1 to 3% TiO₂ was observed morphologically uniform under scanning electron microscopy (SEM). Dynamic mechanical thermal analysis revealed that the magnitude of storage modulus was 3.62-fold higher in SPSS/TiO₂ nanocomposites containing 7 wt. % of TiO₂ than control SSPS indicating improvement in the physical properties of the film supposed to be utilized for food packaging. With respect to the concern over the safety of these nanocomposites,

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