

Preparation of Mungbean starch/PVA nanocomposite films using ZnS nanoparticle

윤현기, 탁혜영¹, 신진영¹, 변현수¹, 윤순도^{1,†}

전남대학교; ¹전남대학교 화공생명공학과

(yunsd03@chonnam.ac.kr[†])

In this study, nanocomposite films were prepared by using mungbean starch(MBS), PVA, zinc sulfide (ZnS) nanoparticles, and plasticizers (glycerol (GL), citric acid (CA), ascorbic acid (AsA), and dopamine (DPM)). ZnS was synthesized by the reaction of Zn(CH₃COO)₂ and Na₂S₂O₃·5H₂O in aqueous solution via a template-free hydrothermal process. The ZnS and MBS/PVA nanocomposite films was characterized by using X-ray diffraction (XRD), fourier transform IR spectrophotometry (FT-IR), and scanning electronic microscope (SEM). The results of the XRD and FT-IR analysis verified that ZnS characteristic peaks existed in the prepared nanocomposite films. The physical properties such as tensile strength (TS), elongation at break (%E), swelling behavior (SB), and solubility (S) of prepared nanocomposite films were investigated. The results indicated that compared with films without added ZnS nanoparticles, the mechanical properties and water resistance were enhanced up to 1.30-1.45 times by the addition of ZnS nanoparticles. The photocatalytic degradability of the prepared films containing ZnS nanoparticles was evaluated using bisphenol A (BPA) and methyl orange (MO) as photodegradation targets.