

Physical properties of bio-epoxy/cellulose nanocrystals nanocomposites

석효희, 김대수[†]

충북대학교

(dskim@chungbuk.ac.kr[†])

Application area of epoxy resin is very wide because generally it has excellent thermal, electrical and mechanical properties. Incorporating natural materials to epoxy resin products would be plausible economically and environmentally. Therefore, in this study, epoxidized soybean oil (ESO) was prepared and mixed with diglycidyl ether of bisphenol A at different ratios and then cured after mixing stoichiometric amount of ethylene diamine. Nanocomposites were also made by incorporating cellulose nanocrystals (CNCs) to the bio-epoxy matrix. The cure behaviors of the bio-epoxy and nanocomposites systems were investigated by DSC. The physical properties were investigated by impact tester, UTM, TGA, DMA and TMA. The physical properties of the bio-epoxy system was best at ESO content of 30% and the nanocomposite with 0.25 phr of CNCs showed best physical properties.