

Titima Sramanee 2014: Structural Effects of Modified Zeolite on Thermomechanical and Barrier Properties of Active Polypropylene Film and γ -Ray Degradation. Master of Science (Packaging Technology), Major Field: Packaging Technology, Department of Packaging and Materials Technology. Thesis Advisor: Assistant Professor Chiravoot Pechyen, Ph.D. 128 pages.

This research was studied the influence of polypropylene (PP) film mixed modified and unmodified zeolite Y and ZSM-5 with polyethylene glycol 4000 (PEG 4000) by blown film extruder at 1 3 and 5 wt%. For structure of zeolite Y and zeolite ZSM-5 on crystallization and chemical properties found that zeolite Y was a FAU structure and better reacted to PEG 4000 than that of zeolite ZSM-5 which was a MFI structure. The study to optimum condition for preparing active PP with modified and unmodified zeolite Y and ZSM-5 films found that PP/modified zeolite Y at 3 wt% was a good film. XRD patterns at $2\theta = 10^\circ$ 15.6° and 20.3° were higher, which increasing of crystallization. Morphology showed the good dispersion and smooth void space of particle and matrix. Thermomechanical properties were slightly increased of strength and glass transition temperature. Oxygen gas and water vapour permeability were clearly increased. The study to optimum condition for irradiated degradation by gamma ray at irradiation dose of 10 50 100 kGy found that irradiation dose of 50 kGy was a good degradation of PP/modified zeolite Y film. It found that chemical properties, morphology, mechanical and barrier properties were obviously decreased because gamma ray induced free radical and affected on the break bond in main chain of PP film. Moreover, modified zeolite Y as efficiency catalyst and could to accelerate degradation of PP film.

Student's signature

Thesis Advisor's signature