

Improvement of Thermal Stability in Ethylene Methyl Acrylate Composites for Gasket Application

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Abstract : A typical used of ethylene methyl acrylate (EMA) gasket is in the manufacture of optical lens, and often, they are deteriorated rapidly due to high temperature during the process. The objective of this project is to improve the thermal stability of the EMA copolymer gasket by preparing EMA with cellulose and silica composites. Hydroxy propyl methyl cellulose (HPMC) and Carboxy methyl cellulose (CMC) were used in preparing of EMA/cellulose composites and fumed silica (SiO₂) was used in preparing EMA/silica composites with different amounts of filler (3, 5, 7, 10, 15 wt.%), using a twin screw extruder at 160 °C and the test specimens were prepared by the injection molding machine. The morphology and dispersion of fillers in the EMA matrix were investigated by field emission scanning electron microscopy (FESEM). The thermal stability of the composite was determined by thermal gravimetric analysis (TGA), and differential scanning calorimeter (DSC). Mechanical properties were evaluated by tensile testing. The developed composites were found to enhance thermal and mechanical properties when compared to that of the EMA copolymer alone.

Keywords : ethylene methyl acrylate, HPMC, Silica, Thermal stability

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