Development of Photodegradable Low Density Polyethylene Blends for Industrial Applications

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Abstract

Photoactivators were used to develop photodegradable Low Density Polyethylene (LDPE) blends. The photoactivators such as TiO$_2$, Coumarin (1,2-Benzopyrone), Camphor (2-Boranone) were added to Low Density Polyethylene (LDPE) separately with different proportions. The mixtures were properly prepared using a laboratory scale internal mixture. The mixed samples were molded into thin sheets using a hydraulic press. The physical mechanical & chemical properties of the blends were tested using tensile, impact, water absorption and Fourier Transform Infrared Spectroscopy (FTIR) at normal environment and exposure to UV lights. The environmental photodegradability of polymer blend was investigated by determining the time dependent stress - strain properties, weight loss and water absorption properties after expose to normal environment and UV source. Tensile strength decreased with increasing UV exposure time of all specimens. Similarly water absorption and weight loss increased with increasing UV exposure time.