Soil burial biodegradation studies of palm oil-based UV-curable films

ABSTRACT

The palm oil-based ultraviolet (uv)-curable films were subjected to an outdoor soil burial test to investigate the biodegradation under natural environment. The films were burial in the soil experiment plot at the Nuclear Malaysiaôs Dengkil complex. The uv-curable films were synthesized from the epoxidized palm oil acrylated (EPOLA) resin and the polyurethane palm oil (POBUA) resin, respectively. Biodegradation tests are more specific to burial film in soil experiments for 12 months under natural conditions. The biodegradability of palm oil resin based uv-curable films were investigated and compared with the petrochemical resin based film. The films properties were compared with respect to properties of the thermal characteristic, the crystallinity, the morphology and the weight loss which are analyzed using the thermogravimetric analysis (TGA), the differential scanning calorimetry (DSC), the scanning electron microscope (SEM), an optical microscope and the weight loss of film calculation. These findings suggested that the palm oil-based uv-curable films show quite satisfactory biodegradation levels.

Keyword: Soil burial; Biodegradation; Palm oil-based UV-curable films