Natural and controlled photo aging of LDPE: changes in structural, molecular and surface characteristics. Khan, Javaid H.; Hamid, S. Halim. The Research Institute, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia. Journal of Polymer Materials (1998), 15(2), 177-184. Publisher: Oxford & IBH Publishing Co. Pvt. Ltd., CODEN: JOPME8 ISSN: 0970-0838. Journal written in English. CAN 130:82241 AN 1998:743828 CAPLUS

Abstract

Environmental degrdn. of UV-stabilized low d. polyethylene (LDPE) film was obsd. for films mounted on a model greenhouse and on aluminum exposure racks, under environmental conditions in Daharan, Saudi Arabia. The drop in percent of elongation was measured to det. the level of degrdn. of LDPE upon weathering. The variations at the mol. chain level were identified by GPC and surface and morphol. changes were monitored by SEM. The polyethylene film mounted on the greenhouse presented higher rate of degrdn. as compared to the film mounted on racks. The controlled environment inside the greenhouse partially prevents dissipation of thermal energy from the greenhouse plastic film during cool night hours and creates a unique environment that leads to higher thermal degrdn. in the mech. strained plastic film from inside. The hostile parameters inside the greenhouse are a dual degrdn. factor in the deterioration of film. The chain scission reaction was predominant during degrdn., causing the drop in elongation and mol. wt. Surface observations also support higher degrdn. process in the film mounted on the greenhouse.