

**Development of polypropylene-based ultraviolet-stabilized formulations for harsh environments.** Hussain, Ikram; Redhwi, Halim Hamid. Department of Chemical Engineering, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia. Journal of Materials Engineering and Performance (2002), 11(3), 317-321. Publisher: ASM International, CODEN: JMEPEG ISSN: 1059-9495. Journal written in English. CAN 137:233356 AN 2002:526902 CAPLUS (Copyright (C) 2008 ACS on SciFinder (R))

### **Abstract**

Three hindered amine light stabilizers (HALS) were used to stabilize polypropylene (PP) film-based formulations that were exposed for 10 mo in Dhahran, Saudi Arabia. Characterization of the exposed PP was done in terms of mech. and Fourier-transform IR (FTIR) spectroscopic properties. The stabilizers were high mol. wt. Chimassorb 944 and Tinuvin 622, and the low mol. wt. Tinuvin 770. The PP film formulations were divided into five categories based on the type of HALS incorporated. This was done to derive meaningful comparison of the various film formulations. The unstabilized PP films were degraded within 2.5 mo of the exposure period. The performance in terms of decrease in mech. properties and FTIR spectroscopic properties was assessed. Following outdoor weathering trials, the lifetimes of certain formulations were detd. On the basis of the FTIR spectroscopic properties, it was detd. that generally, the HALS-stabilized PP film formulations delayed the formation of oxidn. products including esters, carbonyls, and trans-vinylenes.