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CHARACTERIZATION AND WEATHERABILITY PERFORMANCE EVOLUTION IN SAN/EPDM BLENDS VIA PHISICAL AND CHEMICAL MODIFICATION

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This work investigates the accelerated thermal degradation of physical and chemical SAN/EPDM modified blends. In the physical modification stabilizers used were (a) Butanedioic acid ,dimethylester with 4-hydroxy-2,2,6,6- tertamethyl-1-piperdine ethanol (Eversorb 94FD); (b) Poly[[6-[(1,1,3,3-tetramethylbutyl)amino]-1,3,5-triazine-2,4-diyl][(2,2,6,6-tetramethyl-4-piperidinyl)imino]-1,6 -hexanediyl[(2,2,6,6-tetramethyl-4-piperidinyl)imino] (Eversorb 91); (c) 2-(2-hydroxy-3-5--di-tert-amylphenyl) benzotriazole (Eversorb 74); (d) low molecular weigth polyethylene glycol (PEG). In chemical modification the stabilizers were incorporated by melt reaction of 4-amino-2,2,6,6-tetramethylpiperidine (amino HALS) with anhydride functionality of EPDM-MA and 2,2,6,6-tetramethylpiperidine-1-oxyl (radical HALS) with pure EPDM. Amino and radical types of hindered amine light stabilizers (HALS) have bound to the rubber phase of SAN/EPDM blends. Fourier transform infrared spectroscopy (FTIR) has been used to investigate the changes of the chemical structure. The changes of appearance were monitored by spectrophotometer and glossmeter. The IR spectras showed the anhydride band has been almost completely converted to an imide band indicating the reaction was essentially completed. Visual examination of specimen cross-sections after aging, verifies that discoloration is limited to a surface layer, which is the characteristic of degradation where oxygen diffusion into the bulk is limited. Superior weathering performance results when low molecular weight PEG and Eversorbs melt blended into the product. It was found that the stabilizing efficiency of grafted HALS is higher than that of conventional additives after given irradiation time. In the sample improved by radical HALS no inherent advantage was observed in long time.