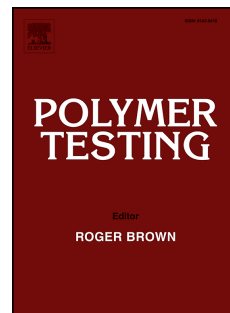


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Polymer life-time prediction: The role of temperature in UV accelerated ageing of polypropylene and its copolymers

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Test Method

Polymer life-time prediction: The role of temperature in UV accelerated ageing of polypropylene and its copolymers

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Keywords: UV, accelerated ageing, weathering, outdoor exposure, radiant energy, degradation, carbonyl index, polypropylene, temperature, copolymer, life-time prediction

Abstract

Correlation of accelerated ageing data with that of outdoor exposure was carried out based on the comparison of total UV radiation energy (TUVR) needed for degradation of the PP - homopolymer, random copolymer (TOT C2 = 3.2 wt.%) and impact copolymer (TOT C2 = 5.4 wt.%) compression moulded 0.5 mm films. Films were stabilized with 1000 ppm butylated hydroxytoluene (BHT) but no UV stabilizer was used. Accelerated ageing was realized in a Q-Sun Xe-1 exposure chamber using a filtered xenon light source and a dry cycle. Weathering was carried out at Brno exposure site, representing the typical mid-European climate. Accelerated ageing was carried out at temperatures of 40, 50, 60 and 70°C. In accelerated ageing, both the onset of carbonyl index (CI) increase and the point of reaching

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