

Fracture behaviour of a polypropylene film

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Abstract :

Ageing of polymers results from structural modifications at the molecular scale and kinetic modelling must be elaborated from analysis of the phenomenon at this scale. However, the change of mechanical properties results from modifications of structure at larger scale, especially the macromolecular scale (chain scission, crosslinking) and or at the macroscopic scale (skin-core structure linked to a superficial attack of the material).

The effect of photoageing on the behaviour of isotactic polypropylene films was studied on samples of weight average molar mass $M_w = 270 \text{ kg mol}^{-1}$. The influence of photoageing on the fracture toughness was examined by using the Essential Work of Fracture (EWF) method. Complementary characterization was performed by FTIR, uniaxial tensile testing. In conclusion, EWF tests performed appear as an interesting method to characterize the influence of structural factors on the fracture properties of polypropylene.

Journal Title / Revue : Materials & Design, ISSN : 0261-3069, DOI : 10.1016/j.matdes.2010.10.016, Issue : 3, Volume : 32, pp. 1515–1519, March 2011.