

## Abstract

Photooxidative processes that lead to chain scission and chain linking in polymers play an important role in polymer degradation. These processes are induced by both ultraviolet (UV) and visible light absorption. The capability of these radiations to be absorbed depends on the existence of chromophores in the polymeric material. Assessment of photodegradation data obtained from a polymer material processed in a conventional manner is of more practical use than extrapolation of data obtained from pure resin. This study reports on the absorption of ultraviolet-light by conventionally processed polyethylene (PE) films. The PE film samples were submitted to UV from fluorescent lamps at 20°C and relative humidity 40% for two hours. Transmission, reflection and emission spectra, from which absorption was inferred, were obtained with an optical spectrum analyzer. The study also reports the natural degradation under solar action of these PE films for a period of up to 150 days. Degradation was analyzed by change of the storage modulus using a dynamic mechanical analyzer instrument. Evidence of chromophoric sites was inferred from the absorption of UV light in the range 250 to 400 nm. However, the UV absorption was low in this range. The drop of storage modulus up to 150 days, averaged for the range (50 to 98°C), fit well a hypothetical polynomial of order two.