

Feczkó, T., Kovács, M., Voncina, B. Improvement of fatigue resistance of spirooxazine in ethyl cellulose and poly(methyl methacrylate) nanoparticles using a hindered amine light stabilizer. *J. Photochem. Photobiol. A* **247** (2012) 1-7.

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Abstract

A spirooxazine dye has been doped in poly(methyl methacrylate) and ethyl cellulose nanoparticles by emulsion - solvent evaporation method. Tinuvin 144 hindered amine light stabilizer with an antioxidant moiety was selected as an efficient photostabilizer for improving the fatigue resistance of the two nanocomposite systems. Entrapment of the stabilizer practically did not increase the size of nanocapsules, however, the duration of the decolouration was enhanced significantly in both poly(methyl methacrylate) and ethyl cellulose, but more substantially in the former one. The half-life of spirooxazine in dichloromethane solution as well as in suspensions of poly(methyl methacrylate) and ethyl cellulose was 0.9 h, 8.4 h and 9.6 h, respectively. Considerable enhancement of fatigue resistance of Tinuvin 144 containing poly(methyl methacrylate)-spirooxazine- (half-life: 35.0 h) and ethyl cellulose-spirooxazine nanocomposite (half-life: 14.8 h) was measured related to the corresponding photochromic nanocomposites without photostabilizer.