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BOOK OF ABSTRACT

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BOOK OF ABSTRACT

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Thermogravimetric study of PE films containing TiO₂, MnO₂ photocatalysts, and their composites

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The aim of this work was to study electrodeposited composite materials in photocatalytic degradation of polyethylene (PE) films vs pure TiO₂, MnO₂, and their mechanical mixture. Composites were obtained from suspension electrolytes based on fluoride-containing ones of MnO₂ electrodeposition. TiO₂ and halloysite (HNTs) as suspension components were considered. PE films were prepared by the casting method with 1% by mass of a photocatalyst. PE films were UV-treated at regular intervals with mass loss control. The best photocatalyst (1:1 ramsdellite&anatase with 15% of mass loss in 70h of UV treatment) demonstrated a synergetic photocatalytic effect compared with pure oxides and TG mass loss. Ramsdellite (97%)&Rutile (1%) composite had activity comparable with pure anatase (about 6% mass loss). Based on TGA data, we determined that the average activation energy of PE decomposition is ca. 200 kJ mol⁻¹. In conclusion, MnO₂-based composites have prospects as (photo)catalysts for the degradation of PE films in variable conditions.