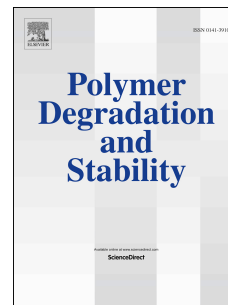


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## Thermooxidative degradation of crosslinked EVA/EPDM copolymers: impact of Aluminium TriHydrate (ATH) filler incorporation

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### Abstract

This study focuses on the thermal oxidation of model composites of insulating materials based on a cross-linked mixture of EVA (Ethylene Vinyl Acetate) and EPDM (Ethylene Propylene Diene Monomer) highly loaded (60 wt %) with ATH (Aluminium TriHydrate) filler. A thorough analysis of the material is performed, focusing not only on the polymer but also on the ATH filler. This preliminary study is essential firstly to determine the possible influence of a large amount micrometric filler incorporation on the structure of crosslinked EVA/EPDM materials, and secondly on the thermooxidative degradation mechanisms at different levels and scales (chemical structure, microstructure and architecture, degradation profile, functional properties...). The structure of both the polymer and the filler are modified during the processing step of the composite. It is shown that the reactivity of the ATH fillers leads to the probable intercalation of some segments of the polymer into the interlayer space of the ATH, and to a much less dense polymer network in the composite compared to the unfilled material. Then, the role of the added ATH filler on the thermooxidative degradation and on the resistance of the composite to ageing is studied. After thermooxidative ageing, there is only a very limited accelerator effect of ATH on the oxidation rate of the polymer within the

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