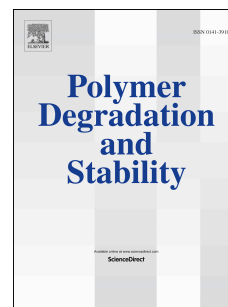


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INFLUENCE OF COLEMANITE ON THE FIRE RETARDANCY OF ETHYLENE-VINYL ACETATE AND ETHYLENE-METHYL ACRYLATE COPOLYMERS

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Abstract

In the present work, colemanite, a hydrated calcium borate, was used as co-filler in aluminium hydroxide/ethylene-vinyl acetate copolymers (ATH/EVA). The presence of colemanite showed an improvement of the fire properties of composites. However, this additive does not act as a synergistic agent with ATH, but seems to increase significantly fire properties by his own. The formation of an expanded layer during cone calorimetry tests insulates the sample and reduces the heat release rate (HRR) values. The performance is ascribed to the hardening of the barrier layer due to the modification of colemanite structure at high temperature. Moreover, to study its mechanisms of fire retardancy and to investigate its potential synergistic effects, colemanite was also introduced as co-filler in magnesium hydroxide (MH)/EVA, ATH/ethylene-methyl acrylate (EMA) and MH/EMA composites.

Keywords: Flame retardancy, Aluminum hydroxide, Magnesium hydroxide, EVA, EMA, Colemanite

1. Introduction

Ethylene-vinyl acetate (EVA) copolymers are commonly used in the cable industry, due to their properties and processing characteristics. However, as the polymer decomposes under heat, a flame can easily be produced, presenting fire risks. In order to achieve standards of fire reaction, a large amount of fire retardant (FR) systems has to be introduced during the process [1]. In EVA copolymers, hydrated mineral fillers, such as aluminium hydroxide

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