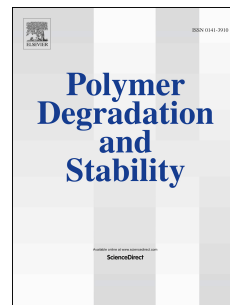


Accepted Manuscript

Key role of magnesium hydroxide surface treatment in the flame retardancy of glass fiber reinforced polyamide 6

M. Casetta, G. Michaux, B. Ohl, S. Duquesne, S. Bourbigot



PII: S0141-3910(18)30014-4

DOI: [10.1016/j.polymdegradstab.2018.01.007](https://doi.org/10.1016/j.polymdegradstab.2018.01.007)

Reference: PDST 8432

To appear in: *Polymer Degradation and Stability*

Received Date: 31 October 2017

Revised Date: 21 December 2017

Accepted Date: 7 January 2018

Please cite this article as: Casetta M, Michaux G, Ohl B, Duquesne S, Bourbigot S, Key role of magnesium hydroxide surface treatment in the flame retardancy of glass fiber reinforced polyamide 6, *Polymer Degradation and Stability* (2018), doi: 10.1016/j.polymdegradstab.2018.01.007.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Key role of magnesium hydroxide surface treatment in the flame retardancy of glass fiber reinforced polyamide 6

M. Casetta^{1*}, G. Michaux¹, B. Ohl², S. Duquesne¹, S. Bourbigot¹

¹Univ. Lille, CNRS, UMR 8207, UMET, Unité Matériaux et Transformations, 59 000 Lille, France

²Schneider Electric, Technopole 38 TEC, 28, rue Henri Tarze, 38050 Grenoble, France

*corresponding author: mathilde.casetta@univ-lille1.fr

Abstract

In this paper, the fire retardant properties of two magnesium dihydroxide (MDH) were compared into glass fiber reinforced polyamide 6 (PA6 GF). The difference between the additives lies in the presence of a vinylsilane treatment at the surface of one of the two MDH (H5A grade) whereas the other is a non-treated MDH (H5 grade). The investigations showed that better fire properties were obtained with PA6 GF/H5A formulation compared to the PA6 GF/H5 one. More precisely, a higher UL-94 rating, a higher glow wire ignition temperature (GWIT) and a higher time to ignition (TTi) at the mass loss calorimeter (MLC) were obtained. To understand the differences between H5 and H5A in terms of fire performances, the mechanisms of degradation of the two fire retarded (FR) formulations was investigated, analyzing both the gas phase and the condensed phase. A significant part of the study was also devoted to the characterization of the ceramic protective layer formed thanks to the use of MDH. The analysis of the gas phase revealed that the degradation products of the two FR formulations were similar. Moreover, as shown by the condensed phase analysis, no chemical reaction occurs between PA6 and H5 or H5A, proving that the MDH surface treatment was not involved in chemical reactions during the processing of the formulation or its degradation. On the contrary, the main differences between the two formulations concern the properties of protective layer formed during the degradation. It was shown that the silane treatment and the

Download English Version:

<https://daneshyari.com/en/article/7824172>

Download Persian Version:

<https://daneshyari.com/article/7824172>

[Daneshyari.com](https://daneshyari.com)