



P-2-571

EFFECT OF HGCP FLAME RETARDANT ON THE FLAMMABILITY PROPERTIES AND THERMAL BEHAVIOR OF COMPOSITE MATERIAL

M. El Gouri^{*}, R. Ziraoui and A. El Harfi

Laboratory of Macromolecular & Organic Chemistry, Department of Chemistry, Faculty of Sciences, Ibn Tofail University, B.P 133, 14000 Kenitra, Morocco

**Corresponding author: gouri_mustapha@yahoo.fr*

Flame retardants (FRs) based on organic phosphorus compounds are known to be one of the most promising candidates that can replace the halogen-based FRs [1]. The advantages of phosphorus containing flame retardants are environmental friendliness.

Recently, organic phosphorus compound have demonstrated good ability in flame retardancy and are believed to generate less toxic gas and smoke than halogencontaining compounds.[2]. Compound HGCP (Hexaglycidyl Cyclotriphosphazène) which has a good thermal stability and halogen free, was designed and synthesized [3]. This reactive flame retardant containing P and N, was added to current bulk commercial polymer diglycidylether of bisphenol A (DGEBA) to enhance flame retardancy. The thermal stability and flame retardancy of HGCP thermoset with MDA curing agent and its blend as flame retardant with DGEBA were checked by thermal gravimetric analysis coupled with infrared spectroscopy TGA/IR and the UL-94 vertical test.

HGCP flame retardant presents a good dispersion in DGEBA, and the blends thermoset with 4,4'-methylene-dianiline (MDA) curing agent leads to a significant improvement of the thermal stability at elevated temperature with higher char yields compared with pure DGEBA thermoset with the same curing agent. HGCP acts with an intumescent char-forming and gas action by CO₂ gas emission which its act to dilute the combustible gas. Improvement has also been observed in the fire behaviour of blend.