

Sustainable flame retardant coating based graphene oxide and montmorillonite

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ABSTRACT

A comparative study of epoxy filled graphene oxide (GO) and montmorillonite (MMT) and its combination on the flame retardancy and thermal stability of epoxy nanocomposite coatings has been investigated. Limiting oxygen index (LOI) and thermogravimetry analysis (TGA) were carried out to determine the flame retardancy and thermal stability properties and clarifying the correlations between different nanofillers fraction. The result suggests that the formation of an efficient hybrid network evidenced by enhanced the flame retardancy as well as thermal stability performance of epoxy nanocomposite coating. The adhesion tape test results revealed that hybrid nanofillers exerts an obviously synergistic effect, demonstrated by the increased in adhesion strength compare to a single nanofillers. Transmission electron microscopy (TEM) revealed a high dispersion of hybrid GO/MMT due to the physical interaction between the nanofillers and epoxy matrix, responsible for the improved of coating's performance.

KEYWORDS

Carbon; Coating; Nanoclay; Non-flammable; Sustainable

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