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**Flame retardancy evaluation of polymer composite-reinforced ceramic nanofillers**

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**Abstract**

The rapid development and widespread use of polymer materials have attracted research into new applications for daily living. However, most polymeric materials suffered with high flammability properties, as they easily ignite and release heat and even toxic gases during combustion. Enhancing polymeric-based materials by incorporating flame retardants has been widely reported. Flame-retardant materials include halogenated and halogen-free flame retardants, phosphorus-containing compounds, and metal hydroxides, which have been widely incorporated in polymer materials but are not considered to meet the requirements of high-performance, eco-friendly polymer applications. Nanomaterials are a new material class that offers multifunctional applications, including flame-retardant fillers. Nanoscale flame-retardant materials can markedly reduce polymer flammability at very low loading levels (<5wt%), such as decreased heat release and mass loss rates. Inorganic ceramic-based nanofillers, such as nanoclay and nanosilica, have attracted growing interest for their flame-retardancy properties and potential to reduce polymer flammability more effectively than conventional flame-retardant materials. © 2023 Elsevier Ltd. All rights reserved.

**Author Keywords**

Ceramic nanofillers; Flame retardants; Inorganic materials; Polymer nanocomposites

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