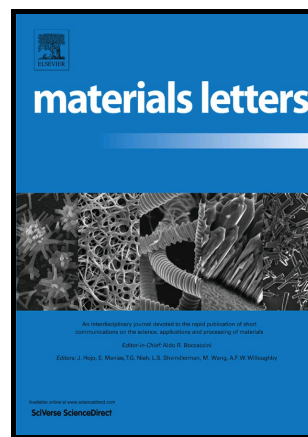


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High performance fire-retarded epoxy imparted by a novel phenophosphazine-containing antflaming compound at ultra-low loading

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**High performance fire-retarded epoxy imparted by a novel phenophosphazine-containing
antiflaming compound at ultra-low loading**

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Abstract

A novel phenophosphazine-containing compound, HD-DPPA, was successfully synthesized via the addition reaction between 5,10-dihydro-phenophosphazine-10-oxide and Schiff base obtained in advance by condensation of 4,4'-diminodiphenylmethane (DDM) and 4-hydroxybenzaldehyde, and used as a co-curing agent of DDM and a flame retardant for DGEBA epoxy resin. The cured epoxy resin passed UL-94 V-0 rating with limiting oxygen index (LOI) of 31.3% at only 2.5 wt% HD-DPPA, where phosphorus content was as low as 0.19 wt%. The formation of intumescent char layer and blowing-out effect during combustion are responsible for high flame retardancy of epoxy resin. The flame-retarded epoxy resin exhibited the improved tensile and impact strength compared with the pristine epoxy resin.

Keywords: Polymers, Phosphors, Epoxy resin, Flame retardancy, Intumescent char, Blowing-out effect

1. Introduction

Epoxy resins have been one of the most widely used engineering materials in modern industrial area

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