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Modification of glass reinforced epoxy composites by ammonium polyphosphate (APP) and melamine polyphosphate (PNA) during the resin powder molding process.

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Abstract

The aim of the studies was to manufacture glass reinforced epoxy composites using technology based on hot pressing with improve flame resistance with good mechanical properties. Ammonium polyphosphate (APP) and melamine polyphosphate (PNA) were used as flame retardants with ranging from 5 to 20 wt. %. The thermal and mechanical properties of the composites were determined in the course of TGA analysis, flammability UL-94 test, limiting oxygen index (LOI) technique, Fourier Transform Infrared Spectroscopy, ultrasonic test and static tensile test. The flame retardancy of modified composites was significantly improved with addition of ammonium polyphosphate and melamine polyphosphate. Moreover, in most cases addition of flame retardants increased strength of composites. This study confirmed that fast and highly efficient Resin Powder Molding manufacturing process allows to produce high quality composites.

Key words Structural composites[A], Powder processing[E], Glass fibres[A], Thermal properties[B], Mechanical properties[B]