

Improved flame retardancy of expandable polystyrene foam via intumescent flame-retardant coating

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Despite great advances, fire safety is a permanent challenge in expanded polystyrene (EPS) foam specially used as the thermal insulating external wall in buildings and constructions. Herein, an effective intumescent flame-retardant was successfully fabricated and encapsulate on the surface of methylene diphenyl diisocyanate (MDI) coated EPS foam to boost flame retardancy. The morphological analysis is revealed that the intumescent flame-retardant materials successfully coated on MDI modified EPS microspheres. The cone calorimetric analysis (CONE) exhibited total heat release (7.3MJ/m^2), heat release rate(57.6kW/m^2), and fire growth rate ($2027.067\text{W/m}^{-2}\text{s}$) and maintained structural integrity after combustion.