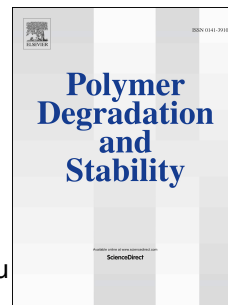


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Synthesis and application of a mono-component intumescent flame retardant for polypropylene

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ABSTRACT

A novel mono-component intumescent flame retardant, named as hyper-branched triazine-piperazine pyrophosphate (HTPPP), is synthesized by using cyanuric chloride, 1-boc-piperazine and phosphoric acid. Chemical structures of HTPPP are characterized by fourier transform infrared (FTIR) spectra, ³¹P nuclear magnetic resonance (NMR), solid-state ¹³C NMR, elemental analysis (EA) and inductively coupled plasma mass spectrometer (ICP-MS). The resulting HTPPP is used alone as an intumescent flame retardant for polypropylene (PP). PP/HTPPP composite can achieve a limiting oxygen index (LOI) value of 30.5% and the vertical burning test (UL-94) V-0 rating at 25 wt% HTPPP loading. Besides, HTPPP is thermally stable with initial decompose temperature as high as

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