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# Flame-retardant thermoplastic polyester based on multiarm aluminum phosphinate for improving anti-dripping

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Highlights

- A novel multi-arm flame retardant aluminum salt of phosphinate is synthesized.
- Adding multi-arm flame retardant into TPEE can enhance the anti-dripping of the TPEE.
- Multi-arm flame retardant combining with MPP shows a synergism effect.
- The anti-dripping and synergism mechanism are proposed.

ABSTRACT

A novel multiarm aluminum salt of pentaerythrityl ester of tetra(carboxyethylmethylphosphinic acid) (Alcpp) was synthesized and added into thermoplastic polyester elastomer (TPEE). Thermal analysis, evolved gas analysis (TGA-FTIR), flammability tests (LOI, UL94), microcombustion calorimeter (MCC) and chemical analyses of residues (SEM-EDX) were used. Alcpp provides TPEE with desired flame retardancy and anti-dripping property and shows a good compatibility with TPEE. TGA-FTIR and SEM-EDX analysis show that Alcpp can depress the heating release and promote the char forming and acts mainly in condensed phase. In addition, Alcpp combining with MPP achieves better fire-resistant performance than