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Phosphorus-containing flame retardant in building applications with flame retardancy, thermal stability and processability

Yoon-Seok Shin, Min-Ji Sim and Sang-Ho Cha
Kyonggi University, South Korea

Building materials consisted of combustible polymers are causing the spread of large-scale fire. Accordingly, many researches on flame retardant materials that can prevent the combustion of polymers have been conducted. So, we synthesized a Phosphorus-containing Flame Retardant (PFR) and prepared Flame Retarded Polylactide (FR-PLA) with different contents of PFR. Limiting Oxygen Index (LOI) and the vertical burning test (UL 94) were performed to evaluate the flame retardancy. The thermal degradation process was analyzed by TGA and real-time FTIR. With 3 wt.% loading of PFR, LOI increased from 23% to 30%. Then the maximum-thermal degradation temperature increased. Additionally, to investigate the mechanical property and melting behavior, UTM and DSC were conducted. As a result, we confirmed that PFR have flame retardancy, thermal stability and processability for PLA.

Biography

Yoon-Seok Shin is an Associate Professor of the Department of Architectural Engineering at Kyonggi University, South Korea. He is conducting research on construction industry such as execution of building works and building equipment.

shinys@kgu.ac.kr