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# Intercalation of Phosphotungstic Acid into Layered Double Hydroxides by Reconstruction Method and Its Application in Intumescent Flame Retardant Poly (lactic acid) Composites

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**Abstract:** Phosphotungstic acid is a typical kind of superior catalysts, and it is hardly to intercalate into the layered double hydroxides (LDH) by ion-exchange process because of its low negative charge. In this work, a phosphotungstic acid intercalated MgAl-LDH (PWA-LDH) was prepared by reconstruction method, and it was then introduced into poly (lactic acid) (PLA) resin in association with intumescent flame retardant (IFR) by melt blending to prepare a flame-retardant biodegradable PLA composite. The effects of PWA-LDH on the flame retardancy of PLA composites were characterized by limiting oxygen index (LOI), vertical burning test (UL-94) and cone calorimeter test. The results showed that the composite sample containing 18.0 wt.% IFR and 2.0 wt.% PWA-LDH achieved the maximal LOI value of 48.3%, passed the UL-94 V-0 rating, and

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