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Abstract

Structures, Optical and Mechanical Properties of PLA/ZnO SiO_2 Al_2O_3 Composite Elaborated by a Solvent Casting Method †

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In this study, granulated polylactic acid and ZnO, SiO_2 and Al_2O_3 powders were mixed to form PLA/ZnO and PLA/ZnO SiO_2 Al_2O_3 composites with different concentrations using a solvent casting method. The influences of ZnO, SiO_2 and Al_2O_3 particles on the physical and mechanical properties of the PLA films were investigated. Chemical and crystal structures are characterized by FTIR-ATR, Crystallinity of PLA/ZnO SiO_2 Al_2O_3 composites are analyzed by X-ray diffraction techniques and Mechanical properties (tensile strength and young modulus) are determined by traction test. The result show an improvement of crystallinity of PLA composites compared of pure PLA and enhanced mechanical properties of module young value and tensile strength value that varied from 2.01 to 3.05 GPA and from 21, 67 to 28,92 MPa, respectively.