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Studies on modification of poly lactic acid to enhance its thermal and mechanical properties

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Poly Lactic Acid's (PLA) industrial applications are limited due to its poor thermal and mechanical properties. Rationale of this present work is to modify PLA by reinforcing it with organically modified MMT clay, thereby making films with properties that are ideally suited for packaging application. PLA flexible films are developed using solvent casting method. The mechanical and thermal properties are studied using tensile test and thermo-gravimetric analysis there by determining the optimum percentage of clay to be loaded. The incorporation of organically modified clay in PLA matrix offered better effect than the incorporation of unmodified clay. The organically modified clay has increased the thermo-mechanical properties. The water absorption and solubility test also support the data from thermo-mechanical tests. The 3 wt % OMMT clay loaded PLA films showed the best results among all. The scope of this work is to extend the level and usage of PLA in packaging and other outdoor applications.

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