

## **ABSTRACT**

### **PREPARATION AND CHARACTERIZATION OF MIXED PLASTIC POLYPROPYLENE (PP) / POLY LACTIC ACID (PLA) WITH ADDITION PLASTICIZER USING NON SOLUTION CASTING METHOD**

**By**

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The mixtures of polypropylene (PP) and poly lactic acid (PLA) with plasticizer had been made by using non solution casting method. Plastics are produced by mixing PP and PLA with the composition ratio (1:0, 3:1, 1:1, 1:3 and 0:1 w/w), and using FT-IR, SEM, DSC, TGA DMS, and biodegradation test for 3 months, the products were characterized. The results showed that all plastic are white, translucent and have different thicknesses. SEM results showed the plastic surface of PP/PLA (3:1) glycerol 10% more homogeneous and flat compared to other samples. From the overall results of the IR spectrum of PP/PLA blend, they didn't show any changes in the new functional groups, since the blending processes take place only physically. Based on literature adding glycerol as a plasticizer in the PP/PLA mixture will decrease a melting temperature ( $T_m$ ) and the rate of decomposition (%TG). This data comply with the experiments. In addition the DMS thermograms showed that the value of storage modulus ( $E'$ ), loss modulus ( $E''$ ), and  $\tan \delta$  of the plastic increases with the temperature and the composition of PLA. Plastic PP/PLA (1:1) glycerol 10% performs the best biodegradability with the percent of weight loss is 77.4%.

**Keywords:** Polypropylene (PP), poly lactic acid (PLA), blending, glycerol, plasticizer.