

Study on Properties of Modified Poly(lactic acid) by Graft Copolymerization of Poly(glycidyl methacrylate)

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Poly(lactic acid) (PLA), a biodegradable and biocompatible aliphatic polyester, is known as a commodity polymer in the medical and pharmaceutical fields. PLA is commercially synthesized from D/L-lactide, a renewable resource monomer derived from corn starch. It is a potential alternative to petroleum-based polymers as the latter face problems associated with an increasing waste disposal and cost. However, there are serious limitations such as notably brittleness and a low heat distortion temperature. These are as a result of the low T_g of PLA (55~65 °C) and the less E-modulus above T_g. In order to improve the brittleness and thermal stability of PLA, many approaches have been explored by methods such as copolymerization, plasticization, and blending with other polymers. On investigating these mentioned results to modify PLA, it was understood to be more effective to have a graft copolymerization with poly(glycidyl methacrylate) (PGMA). In this study, a PLA-g-PGMA was prepared by radical polymerization of PLA and macro-initiator.