BIODEGRADABILITY STUDY OF PLA/PANDANUS AMARYLLIFOLIUS COMPOSITE IN BURIED SOIL AND OPEN-AIR ENVIRONMENT

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"I declare that this thesis is the result of my own work except the ideas and summaries which I have clarified their sources. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any degree"

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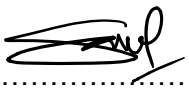
Signed : 

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ABSTRACT

PLA stands for Polylactic Acid, which is a type of biodegradable plastic mainly used for packaging such as plastic films and food container. It is a natural polymer designed to substitute the widely used petroleum-based plastic. PLA usually takes around 3 to 12 months to degrade and it is one of plastic with the shortest degradable periods. Even though the PLA degradability could be considered faster when compared to other petroleum-based plastics, however, if compared to the rate of plastic wastes produced, the plastic waste management is still unresolved. In this study, the degradation of virgin PLA/Pandanus Amaryllifolius composite and recycled PLA/Pandanus Amaryllifolius composites are investigated. PLA/Pandanus Amaryllifolius composite had been prepared using solvent casting method. For both virgin PLA/Pandanus Amaryllifolius composite and recycled PLA/Pandanus Amaryllifolius composite, the filler composition varies at 5wt%, 10wt% 15wt% and 20wt%. The samples were than exposed to two different environment which were in buried soil and open-air environment, under direct sunlight for 6 weeks. The weight loss is measured and degradation rate were than analyzed. The results show that by increasing the wt% of Pandanus Amaryllifolius in PLA matrix has increases the degradation rate. The degradation rate of PLA/Pandanus Amaryllifolius composite in buried soil is much accelerated as compared to degradation rate in open environment. The results also revealed that degradation rate of virgin PLA/Pandanus Amaryllifolius composite is higher than recycled PLA/Pandanus Amaryllifolius composite in both exposure environment. The finding remarks the potential of Pandanus Amaryllifolius as optimistic alternative filler in PLA biocomposite.