

**CHARACTERIZATION AND PROPERTIES OF
POLY LACTIC ACID (PLA) FILLED MICROCRYSTALLINE CELLULOSE FROM
RICE HUSK**

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ABSTRACT

CHARACTERIZATION AND PROPERTIES OF POLY LACTIC ACID (PLA) FILLED MICROCRYSTALLINE CELLULOSE FROM RICE HUSK

Rice is a cereal grain that is one of the most widely consumed staple food in the world. During the processing of rice, there also produce a large number of rice husk as agricultural waste. Rice husk is the protective outer covering of the rice grain and it is hard and inedible. This agricultural waste usually was burned in order to eliminate it. However, burning this waste will lead to air pollution due to releasing of CO₂ and ashes which can contribute to global warming and haze. In order to reduce the burning waste activities, in this study rice husk was reused to produce micro-crystalline cellulose (MCC) to incorporate with another biodegradable plastic which is poly lactic acid (PLA) in order to identify the characterization and properties (tensile strength, tensile modulus, elongation at break and degradability) of PLA/MCC with the addition of epoxidized palm oil (EPO) as plasticizer. The use of MCC as filler is due to the its smaller size compared to RH and also MCC does not have hemi-cellulose and lignin which can affect the mechanical properties and characteristic of PLA. The method that was used to produce the plastic film was casting method. The presence of MCC and EPO in PLA polymeric matrix alter the properties and characters of pure PLA. All tensile properties of PLA were reduced with the addition of MCC and EPO. This is due to the MCC does not compatible with PLA. In the other hand, the addition of EPO that reduce the elongation at break were may due to the improper processing method. However, soil degradability of PLA greatly increased with the addition of MCC and EPO. This is because, MCC and EPO were utilized by bacteria and fungi inside the soil as food sources. MCC and EPO were composed easily because of the presence of enzyme from the microbes from the soil.