A Comparative Study on the Desiccant Effect of Polypropylene and Polylactic Acid Composites Reinforced with Different Lignocellulosic Fibres

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Abstract
Awareness of the sustainability of the environment has inspired many researchers to explore the benefits of renewable resources like plant-based fibre, which then introduces the topic of the output of green products. The potential of polypropylene (PP) and polylactic acid (PLA) based composites with two types of natural fibres, palm oil empty fruit bunch (EFB) and microcrystalline cellulose (MCC), as a moisture absorbent or desiccant was investigated. PP and PLA composites with various contents of EFB and MCC fibres were prepared using an internal mixer followed by hot pressing. To evaluate their use in certain applications, moisture uptake was measured through water absorption testing. Experimental results indicated that moisture uptake influenced by fibre loading, size of fibre and type of matrix. PLA/MCC composites exhibit considerable moisture uptake compared to other composite samples. Qualitative moisture uptake measurement was also carried out by packing the composites and green chillies in plastic bags and storing them at ambient humidity and temperature. The efficiency of the composites as a desiccant was in agreement with the results of the water test. Therefore, the developed composites have the potential to be used as a desiccant.

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