

**DEVELOPMENT OF CASSAVA BAGASSE REINFORCED THERMOPLASTIC
CASSAVA STARCH SHEETS**

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Due to awareness of environmental and sustainability issues, eco-friendly natural fibres have generated much interest as reinforcing agents in thermoplastic composites. Cassava starch-based composite sheets were prepared using cassava bagasse, which was passed through a 500-mesh sieve as filler, and it is a by-product of the cassava starch extraction process. Composite sheets were prepared through compression moulding technique using glycerol as the plasticizer, and three concentrations of cassava bagasse were incorporated during composite preparation. Then, the physical and structural properties of the composite sheets were investigated. According to the Scanning Electron Microscope (SEM) micrographs, composites with high fibres content (30% w/w) exhibited more heterogeneous surfaces and showed pull-out of fibres, which the presence of voids could be observed on the images of the composites with fracture. The concentration of bagasse had a significant influence on the physical properties of composite sheets. The tensile strength of composite sheets increased from 2.11 to 3.56, 3.93, and 11.78 MPa after adding 10, 20 and 30% (w/w) of cassava bagasse, respectively. However, the tensile strain at break decreased as the cassava bagasse material concentration was increased. Besides, the hardness of the composite sheets increased by about 74% as the cassava bagasse 10% (w/w) was added to the composite. All the composite sheets were biodegradable, and the water absorption of the composite sheets increased as the cassava bagasse material concentration was increased. The utilization of cassava bagasse as a reinforcement agent for cassava starch-based thermoplastic sheets added value to the waste produced during starch extraction while promising environmental sustainability.

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