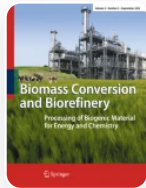


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Coir/banana hybrid composites reinforced with poly vinyl ester for mechanical, water absorption and thermal characterization

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Abstract

Natural fiber has recently been developed as a reinforcing material for a wide variety of applications in reinforced plastics. It is preferred as a reinforcement material in the production of polymer matrix composites due to its biodegradability, low cost, relatively low density, environmental friendliness, and moderate mechanical properties. In this experiment, compression-molded composites were created using coir fiber (CF) and banana fiber (BF) as reinforcement and poly vinyl ester (PVE) as matrix. Eight different composite

compositions (S1 to S8) were prepared, with the weight percentage of CF and BF adjusted to 0 (neat polymer), 7.5, 12.5, 17.5, 22.5, 27.5, and 35%. Tensile tests, flexural tests, and impact tests were conducted to determine the mechanical strength of the material. The samples were created following the appropriate ASTM mechanical testing standards and then tested accordingly. The water absorption test employed three different types of water-normal water, sea water, and distilled water. The thermal characteristics of the hybrid biocomposites were also examined using thermogravimetric analysis (TGA). Among the eight samples, sample S6 (Banana 22.5% & Coir 12.5%) exhibited the highest mechanical and thermal strength when compared to the other seven samples.

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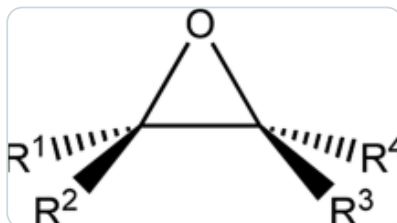
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Data availability

All data are available within manuscript.

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S. Arunkumar: Supervision, review & editing, validation.

A. Madhanagopal: Investigation, formal analysis.

R. Purushothaman: Visualization & project administration.

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Ethics declarations

Ethics approval

Not applicable.

Consent to participate

Informed consent was obtained from all individual participants included in the study.

Conflict of interest

The authors declare no competing interests.

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