

Composites from renewable and sustainable resources: Challenges and innovations

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Abstract

Interest in constructing composite materials from biosourced, recycled materials; waste resources; and their combinations is growing. Biocomposites have attracted the attention of automakers for the design of lightweight parts. Hybrid biocomposites made of petrochemical-based and biosourced materials have led to technological advances in manufacturing. Greener biocomposites from plant-derived fiber and crop-derived plastics with higher biobased content are continuously being developed. Biodegradable composites have shown potential for major uses in sustainable packaging. Recycled plastic materials originally destined for landfills can be redirected and repurposed for blending in composite applications, thus leading to reduced dependence on virgin petro-based materials. Studies on compatibility of recycled and waste materials with other components in composite structure for improved interface and better mechanical performance pose major scientific challenges. This research holds the promise of advancing a key global sustainability goal.

