

Biopolymer blends with advanced cost-performance ratio for packaging and agricultural applications

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The growing contamination of our ecosystems with partly degraded plastics leads to an increasing demand for completely biodegradable packaging and agricultural foils. The biodegradable polymers available in the market often cannot yet compete with “traditional” petrochemically based polymers regarding either their cost or their performance. Thermoplastic biopolymers like polylactic acid (PLA) and polyhydroxybutyrate (PHB) offer high stiffness and strength but show brittle failure at low strains, whereas others like polycaprolactone (PCL) and polybutylenadipat-terephthalat (PBAT) offer high strain and ductility at low strength and stiffness. However, the use of biopolymers is still limited due to their comparably high cost.

With the addition of a cheap biobased filler, like babassu powder – a cheap by-product from oil processing, we show that we can optimise the cost-performance ratio of polymer blends and at the same time benefit from changes in the crystallization behavior during processing and advanced biodegradability. With blends of a stiff and a ductile polymer we can adjust the properties to stiffened polymers with increased ductility.

We will give an insight into the complex relationships between processing method, processability, polymer composition, filler content and thermo-mechanical composite properties of babassu filled biopolymer blends.