

## **Surface modification of coconut shell powder filled polylactic acid biocomposites**

### **Abstract**

The acrylic acid was used as chemical modifier to improve the properties of coconut shell powder (CSP) filled polylactic acid (PLA) biocomposites. The effects of filler content and acrylic acid on tensile properties, thermal properties, and morphology of PLA/CSP biocomposites were investigated. It was found that the addition of CSP to PLA biocomposites have decreased the tensile strength and elongation at break, however the modulus of elasticity increased. The treated PLA/CSP biocomposites with acrylic acid have higher tensile strength and modulus of elasticity but lower elongation at break. Surface treatment using acrylic acid has enhanced filler-matrix interaction. The thermal stability of biocomposites increased with increasing CSP content. The treated biocomposites has better thermal stability than untreated biocomposites. The dispersion and interfacial adhesion between the CSP and PLA polymer were important factor to improve the thermal stability of treated biocomposites. The better interfacial interaction between CSP and PLA matrix was confirmed through scanning electron microscope study.

**Keywords** — Acrylic acid, biocomposites, coconut shell powder, polylactic acid.