
Advanced Materials Research Group project summary

Project Title	Use of Sorbitol-ended Polylactic Acid (S-PLA) as a coupling agent for Phosphate Glass Fibre/ Polylactic Acid Composites
Researcher	Madhavia S. Perera
Project Summary	<p>This project involves improving the interface between resorbable phosphate glass fibres (PGF) and the Polylactic Acid (PLA) matrix by using S-PLA, a novel coupling agent developed by the group. After 6-14 weeks degradation in an aqueous environment, the mechanical properties of PGF/PLA composites have been shown to decline. The loss in mechanical properties has been attributed to a loss of interfacial adhesion between fibre and polymer matrix.</p> <p>Three different chain lengths of S-PLA were synthesised: short, medium and long. The S-PLA oligomer was characterised using NMR, GPC, DSC and FTIR. Each chain length was used to coat PGF which were then embedded in PLA. The interfacial shear strength (IFSS) was assessed using the Single Fibre Fragmentation Test (SFFT) and compared to control, uncoated fibres. See link below. One of the chain lengths was selected to make a full body composite in order to assess the effect of the coupling agent on interfacial and mechanical properties during degradation.</p>