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Influence of Modified and Unmodified Cow Bone on the Mechanical Properties of Reinforced Polyester Composites for Biomedical Applications

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Abstract : This work was carried out to investigate comparatively the effects of modified and unmodified cow bone particles on the mechanical properties of polyester matrix composites in order to investigate the suitability of the materials as biomaterial. Cow bones were procured from an abattoir, sun dried for 4 weeks and crushed. The crushed bones were divided into two, where one part was turned to ash while the other part was pulverized with laboratory ball mill before the two grades were sieved using 75 µm sieve size. Bone ash and bone particle reinforced tensile and flexural composite samples were developed from pre-determined proportions of 2, 4, 6, and 8 %. The samples after curing were stripped from the moulds and were allowed to further cure for 3 weeks before tensile and flexural tests were performed on them. The tensile test result showed that, 8 wt % bone particle reinforced polyester composites has higher tensile properties except for modulus of elasticity where 8 wt % bone ash particle reinforced composites has higher value while for flexural test, bone ash particle reinforced composites demonstrate the best flexural properties. The results show that these materials are structurally compatible.

Keywords : biomedical, composites, cow bone, mechanical properties, polyester, reinforcement
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