DEVELOPMENT AND DEGRADABILITY STUDY OF POLYESTER/LOCUST BEAN SEED COMPOSITE

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ABSTRACT
The synthesis and characterization of polyester/locus bean seed (LBS) composite was undertaken by Hand lay-up method. The Locus bean was varied between 0 and 30 wt% at 425 μm sieve size. Cobalt accelerator and Methyl-ethyl Ketone catalyst were respectively utilized to initiate polymerization reaction and speed up the reaction. The composite samples were subjected to soil burial and natural weathering tests for three months. Tensile, Flexural, Impact, Hardness tests and microstructures of the composite samples were determined. Visual examinations of the soil buried samples revealed slightly dark patches while microstructural examinations showed rough surfaces with presence of voids. Nutrient Ager and Potato Dextrose Ager were used for microbial analysis by isolating Bacterial and Fungal micro-organisms with high bacterial colony forming unit per gram of 5.22 x 10^7 after 30 days and 4.7 x 10^6 Cfu/gm fungal counts in the first 30 days. The tensile strength of the composites decreased with increase in % LBS while the flexural strength slightly increased with increase in % LBS. The highest and least Impact Energy values of 0.6 and 0.28 J respectively were obtained for the naturally-weathered sample. The Hardness Values increased with addition of LBS; from 16.4 HRF (at 0 wt% LBS), at the end of the first month, to 75.9 HRF (at 30 wt% LBS) at the end of the third month for the naturally-weathered samples while those for soil-buried samples increased from 12.8 HRF (at 10 wt% LBS) after the first month to 73.03 HRF (30 wt% LBS) at the end of third month.