

Tensile and Flexural Behavior of Particulate Filled/Polymer Matrix Composites

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Abstract : This paper experimentally investigates the flexural and tensile properties of the industrial wastes sewage sludge ash (SSA) and fly ash (FA), and conventional ceramic powder silicon carbide (SiC) filled polyester composites. Four weight fractions (5, 10, 15 and 20 wt%) for each micro filler were used for production of composites. Then, test samples were produced according to ASTM. The resulting degree of particle dispersion in the polymer matrix was visualized by using scanning electron microscope (SEM). Results from this study showed that the tensile strength increased up to its maximum value at filler content 5 wt% of SSA, FA and SiC. Flexural strength increased with addition of particulate filler up to its maximum value at filler content 5 wt% of SSA and FA while for SiC decreased for all weight fractions gradually. The addition of SSA, FA and SiC fillers resulted in increase of tensile and flexural modulus for all the particulate composites. Industrial waste SSA can be used as an additive with polymer to produce composite materials.

Keywords : particle-reinforcement, sewage sludge ash, polymer matrix composites, mechanical properties

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