World Academy of Science, Engineering and Technology
International Journal of Materials and Metallurgical Engineering
Vol:10, No:01, 2016

Effects of Interfacial Modification Techniques on the Mechanical Properties of Natural Particle Based Polymer Composites

Authors : Bahar Basturk, Secil Celik Erbas, Sevket Can Sarikaya

Abstract : Composites combining the particulates and polymer components have attracted great interest in various application areas such as packaging, furniture, electronics and automotive industries. For strengthening the plastic matrices, the utilization of natural fillers instead of traditional reinforcement materials has received increased attention. The properties of natural filler based polymer composites (NFPC) may be improved by applying proper surface modification techniques to the powder phase of the structures. In this study, acorn powder-epoxy and pine corn powder-epoxy composites containing up to 45% weight percent particulates were prepared by casting method. Alkali treatment and acetylation techniques were carried out to the natural particulates for investigating their influences under mechanical forces. The effects of filler type and content on the tensile properties of the composites were compared with neat epoxy. According to the quasi-static tensile tests, the pine cone based composites showed slightly higher rigidity and strength properties compared to the acorn reinforced samples. Furthermore, the structures independent of powder type and surface modification technique, showed higher tensile properties with increasing the particle content.

Keywords : natural fillers, polymer composites, surface modifications, tensile properties
Conference Title : ICCM 2016 : International Conference on Composite Materials
Conference Location : London, United Kingdom
Conference Dates : January 18-19, 2016