World Academy of Science, Engineering and Technology
International Journal of Materials and Metallurgical Engineering
Vol:11, No:12, 2017

Environmental Effects on Coconut Coir Fiber Epoxy Composites Having TiO_2 as Filler

Authors : Srikanth Korla, Mahesh Sharnangat

Abstract : Composite materials are being widely used in Aerospace, Naval, Defence and other branches of engineering applications. Studies on natural fibers is another emerging research area as they are available in abundance, and also due to their eco-friendly in nature. India being one of the major producer of coir, there is always a scope to study the possibilities of exploring coir as reinforment, and with different combinations of other elements of the composite. In present investigation effort is made to utilize properties possessed by natural fiber and make them enable with polymer/epoxy resin. In natural fiber coconut coir is used as reinforcement fiber in epoxy resin with varying weight percentages of fiber and filler material. Titanium dioxide powder (TiO2) is used as filler material with varying weight percentage including 0%, 2% and 4% are considered for experimentation. Environmental effects on the performance of the composite plate are also studied and presented in this project work; Moisture absorption test for composite specimens is conducted using different solvents including Kerosene, Mineral Water and Saline Water, and its absorption capacity is evaluated. Analysis is carried out in different combinations of Coir as fiber and TiO2 as filler material, and the best suitable composite material considering the strength and environmental effects is identified in this work. Therefore, the significant combination of the composite material is with following composition: 2% TiO2 powder 15% of coir fibre and 83% epoxy, under unique mechanical and environmental conditions considered in the work.

Keywords : composite materials, moisture test, filler material, natural fibre composites
Conference Title : ICACCMT 2017 : International Conference on Advanced Ceramics, Composites, Materials and Technologies
Conference Location : Miami, United States
Conference Dates : December 14-15, 2017