World Academy of Science, Engineering and Technology
International Journal of Materials and Metallurgical Engineering
Vol:12, No:05, 2018

Poly(S/DVB)HIPE Filled with Cellulose from Water Hyacinth

Authors : Metinee Kawsomboon, Thanchanok Tulaphol, Manit Nithitanakul, Jitima Preechawong

Abstract : PolyHIPE is a porous polymeric material from polymerization of high internal phase emulsion (HIPE) which contains 74% of internal phase (disperse phase) and 26 % of external phase (continues phase). Typically, polyHIPE was prepared from styrene (S) and divinylbenzene (DVB) and they were used in various kind of applications such as catalyst support, gas adsorption, separation membranes, and tissue engineering scaffolds due to high specific surface areas, high porousity, ability to adsorb large quantities of liquid. In this research, cellulose from water hyacinth (Eichornia Crassipes), an aquatic plant that grows and spread rapidly in rivers and waterways in Thailand was added into polyHIPE to increase mechanical property of polyHIPE. Addition of unmodified and modified cellulose to poly(S/DVB)HIPE resulting in a decrease in the surface area and thermal stability of the resulting materials. Mechanical properties of the resulting polyHIPEs filled with both unmodified and modified cellulose exhibited higher compressive strength and Young's modulus by 146.3% and 162.5% respectively, compared to unfilled polyHIPEs. The water adsorption capacity of filled polyHIPE was also improved.

Keywords : porous polymer, PolyHIPE, cellulose, surface modification, water hyacinth
Conference Title : ICPC 2018 : International Conference on Polymers and Composites
Conference Location : Paris, France
Conference Dates : May 17-18, 2018