World Academy of Science, Engineering and Technology
International Journal of Materials and Metallurgical Engineering
Vol:13, No:02, 2019

Advanced Materials Based on Ethylene-Propylene-Diene Terpolymers and Organically Modified Montmorillonite

Authors : M. D. Stelescu, E. Manaila, G. Pelin, M. Georgescu, M. Sonmez

Abstract : This paper presents studies on the development and characterization of nanocomposites based on ethylene-propylene terpolymer rubber (EPDM), chlorobutyl rubber (IIR-Cl) and organically modified montmorillonite (OMMT). Mixtures were made containing 0, 3 and 6 phr (parts per 100 parts rubber) OMMT, respectively. They were obtained by melt intercalation in an internal mixer - Plasti-Corder Brabender, in suitable blending parameters, at high temperature for 11 minutes. Curing agents were embedded on a laboratory roller at 70-100 ºC, friction 1:1.1, processing time 5 minutes. Rubber specimens were obtained by compression, using a hydraulic press at 165 ºC and a pressing force of 300 kN. Curing time, determined using the Monsanto rheometer, decreases with the increased amount of OMMT in the mixtures. At the same time, it was noticed that mixtures containing OMMT show improvement in physical-mechanical properties. These types of nanocomposites may be used to obtain rubber seals for the space application or for other areas of application.

Keywords : chlorobutyl rubber, ethylene-propylene-diene terpolymers, montmorillonite, rubber seals, space application
Conference Title : ICCNAM 2019 : International Conference on Chemistry, Nanotechnology and Advanced Materials
Conference Location : Amsterdam, Netherlands
Conference Dates : February 07-08, 2019