World Academy of Science, Engineering and Technology
International Journal of Materials and Metallurgical Engineering
Vol:9, No:08, 2015

POSS as Modifiers and Additives for Elastomer Composites

Authors : Anna Strąkowska, Marian Zaborski

Abstract : The studies were focused on POSS application with methylvinylsilicone rubber (MVQ). The obtained results indicate that they can be successfully incorporated into silica-filled rubbers as modifying agents since they enhance cross-link density and improve most properties of the resulting network. It is also worth noting that the incorporation of POSS molecules resulted in stabilizing effect against adverse changes induced by the climatic, ozone or UV ageing of the rubbers. Furthermore, we obtained interesting results of rubbers surface modification using POSS functionalised with halogen groups (Cl, F, and Br). As the results, surface energy of the elastomeric composites and their hydrophobicity increased, barrier properties improved and thermal stability increased as well. Additionally, the studies with silicone rubber and POSS containing acidic and alkaline groups revealed composites with self-healing properties. The observed effects strictly depend on a kind and quantity of functional groups present in angles of POSS cages.

Keywords : elastomeric composites,POSS, properties modyfication, silicone rubber
Conference Title : ICMMPE 2015 : International Conference on Materials, Minerals and Polymer Engineering
Conference Location : Venice, Italy
Conference Dates : August 13-14, 2015