

Investigations of Flame Retardant Properties of Beneficiated Huntite and Hydromagnesite Mineral Reinforced Polymer Composites

Authors : H. Yilmaz Atay

Abstract : Huntite and hydromagnesite minerals have been used as additive materials to achieve incombustible material due to their inflammability property. Those fire retardants materials can help to extinguish in the early stages of fire. Thus dispersion of the flame can be prevented even if the fire started. Huntite and hydromagnesite minerals are known to impart fire-proofing of the polymer composites. However, the additives used in the applications led to deterioration in the mechanical properties due to the usage of high amount of the powders in the composites. In this study, by enriching huntite and hydromagnesite, it was aimed to use purer minerals to reinforce the polymer composites. Thus, predictably, using purer mineral will lead to use lower amount of mineral powders. By this manner, the minerals free from impurities by various processes were added to the polymer matrix with different loading level and grades. Different types of samples were manufactured, and subsequently characterized by XRD, SEM-EDS, XRF and flame-retardant tests. Tensile strength and elongation at break values were determined according to loading levels and grades. Besides, a comparison on the properties of the polymer composites produced by using of minerals with and without impurities was performed. As a result of the work, it was concluded that it is required to use beneficiated minerals to provide better fire-proofing behaviors in the polymer composites.

Keywords : flame retardant, huntite and hydromagnesite, mechanical property, polymer composites

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