

“SYNTHESIZE AND CHARACTERIZATION OF ELASTOMERIC COMPOSITE”

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ABSTRACT

Nanocomposites of natural rubber and carboxy methyl cellulose fully interpenetrating polymer network have been prepared for high performance elastomeric engineering applications. Natural rubber is an excellent elastomeric material with better stability. It cannot be used for any specific applications due the poor thermal stability. The stability of natural rubber can be enhanced by vulcanizing rubber with suitable cross-linking agents and activators. Vulcanization of rubber using Sulphur and peroxide are the main methods adopted in rubber industries to improve the stability. Very recently, a new system to vulcanize rubber-using glutaraldehyde has been introduced. According to this method, rubber vulcanizes at very low temperature compared to other conventional methods.

Blending of polymer is an easy way to develop material with desired physical properties. Simple blends show phase separation and immiscible nature. For immiscible blends, addition of common cross linking agent for both the polymers enhances the strength considerably. The formation of three-dimensional network between two phases increases the stability. The resulting materials become an interpenetrating polymer network. In the present study, interpenetrating polymer network has been prepared by using natural rubber and carboxy methyl cellulose. Glutaraldehyde plays a major to vulcanize or crosslink both the phases simultaneously. Nano silica is used as the filler for the preparation of Nano composites by using latex blending method. The resulting samples have been introduced for mechanical characterization.

It is found that, the addition of nanoparticle into the interpenetrating polymer network enhances the tensile properties and hardness. Such type of rubber-based materials can be used to develop elastomeric articles with higher stability.

KEYWORDS: Carboxy Methyl Cellulose, Immiscible Blends, Glutaraldehyde and Vulcanize

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