Dielectric, thermal and morphological characteristics of Nitrile Butadiene Rubber under effect filler/hybrid filler

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Abstract:-

This paper worked to enhance the characteristics of Nitrile butadiene Rubber (NBR) such as dielectric, thermal characteristics for industrial applications, by adding different concentrations of industrial waste (quartz) and by-product (silica fume) from manufacture of ferrosilicon alloys in rubber matrix . the dielectric characteristics of NBR composites was studied by measuring dielectric strength, also studied the effect of hybrid filler on NBR composites by adding various concentrations of mica filler to the concentration of silica fume and quartz. The thermal characteristics of NBR composites were investigated in this work with filler and hybrid filler on NBR. The particle size and particle shape of silica fume and quartz was studied by using Transmission Electron Microscopy (TEM). For these composites the Scan Electron Microscopy (SEM) was done.

Keywords:-

Thermal characteristics, dielectric characteristics, Nitrile butadiene rubber (NBR), silica fume, quartz, hybrid filler, TEM, SEM.

1. Introduction:-

The development in rubber industry increases day after day this due to the importance of rubber in our life, since it has a lot of applications in different fields and industries according to the importance of the rubber and the active role has played in the development of modern civilization. For this reason several studies and research projects seeking to improve rubber characteristics such as electrical, mechanical, thermal and morphological characteristics by addition different types of filler [1-4]. A lot of studies and research projects achieved a good success in enhancement rubber properties and this extend the uses cycle of rubber in our life and introduce a lot of services to peoples, save the efforts , money and also save the environment from a lot of harms [5-6].Rubber have poor properties and not self-reinforcing rubber. For example, nitrile butadiene rubber does not crystallize when it`s stretched, and it needs reinforcing fillers to enhance their properties such as tensile strength and tear resistance. Synthetic