THESIS

UTILIZATION OF VARIOUS FILLERS FOR RUBBER MAT DEVELOPMENT

THIRANAN THUECHART

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The application of natural zeolite as filler in natural rubber industry in comparison with $CaCO_3$ and rice husk ash (RHA) at 100, 159, 200 and 250 phr loading was investigated. The study on cure characteristics of rubber compound was found that scorch time and optimum curing time tended to decrease with increasing natural zeolite and $CaCO_3$ loading, however, the rubber filled with RHA showed the opposite trend. For mechanical properties, natural zeolite-filled vulcanizates gave moderate hardness and compressions set. With the increase in filler loading, the hardness increased, while the compression set impaired. Natural zeolite- and RHA-filled vulcanizates showed an improvement in abrasion resistance when filler loading was increased, but an inverse effect was found in vulcanizates filled with $CaCO_3$ in which the abrasion resistance was found to decrease. Vulcanizates filled with natural zeolite gave the highest tear strength, followed by that filled with $CaCO_3$ and RHA. The more the filler loading, the poorer the tear strength can be obtained. The heat aging and the fluid resistance of vulcainazates was also investigated. It is discovered that the natural zeolite-filled vulcanizate exhibits the greater heat stability than $CaCO_3$- and RHA-filled vulcanizates. At the particular filler loading at 200 phr, it is found that natural zeolite-filled and RHA-filled vulcanizates have smaller percentage change in mechanical properties than $CaCO_3$-filled vulcanizates.

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