Pirongrong Prasertpong 2011: Improving Thermal Property of cis-1,4-polyisoprene Using Natural Fillers. Master of Science (Chemistry), Major Field: Chemistry, Department of Chemistry. Thesis Advisor: Assistant Professor Wirunya Keawwattana, Ph.D. 116 pages.

The objective of this research was to study properties of thermal insulation products from natural rubber filled with natural fillers including perlite, fly ash, rice husk ash, and cellulose fiber from water hyacinth. Properties studied in this work were hardness, compression set, tear strength, modulus, elongation at break and thermal conductivity of the filled natural rubber vulcanizates. The properties of NR vulcanizates were investigated at two different formulations i.e. NR vulcanizates filled with different content of silica from natural resource i.e. perlite, fly ash, rice husk ash (0-60 phr) and NR vulcanizates filled with different content of water hyacinth fiber (0-7 phr). From experimental results, it was found that NR vulcanizates filled with 20 phr of silica and 5 phr of water hyacinth exhibited little improvement in mechanical properties especially tear strength. Therefore, The recommended dosage of silica from natural resource and water hyacinth fiber for using as filler in NR vulcanizates for producing thermal insulation was 20 phr and 5 phr, respectively. The thermal insulation samples of filled NR vulcanizates are molded for testing the thermal properties followed the ASTM C177 standard. From the result, it was found that the thermal insulation of NR vulcanizates filled with natural fillers had thermal conductivity ranging from 0.072 to 0.078 W/m.K. The success of this work proclaims a high feasibility of producing thermal insulation from natural rubber filled with natural fillers.

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