Chalong Tonklongchan 2011: Development of Natural Rubber from Water Hyacinth for Alternative Sound Absorption Material. Master of Science (Chemistry), Major Field: Chemistry, Department of Chemistry. Thesis Advisor: Assistant Professor Wirunya Keawwattana, Ph.D. 166 pages.

Sound absorptive materials are produced from solid dry natural rubber (NR) with the addition of 4,4'-oxybis (benzene sulfonyl) hydrazide (OBSH) as a blowing agent and were expanded using compression molding technique with utilization of heat transfer process. The cure behavior, physical, mechanical and acoustic absorption properties of the NR foams were investigated at three different foaming temperatures, i.e. 150, 160, and 170°C and different feeding ratio of the water hyacinth (0, 5, 10 phr) including blowing agent (0, 2, 4, 6 phr). Acoustics determination of sound absorption coefficient (α) in impedance tube according to ISO 10534-2 at thickness of 13 mm was used at two different ranges of frequency. This research is aim to study the influence of foaming temperature, water hyacinth and blowing agent content and the resultant NR foam cell structure on the acoustic properties called the noise reduction coefficient (NRC). This study focuses on the factors that affect the acoustic and mechanical properties of the foams that are related to changes in the cure behavior, morphology and foam physical properties. The results showed that the morphology, physical and compressive properties of the NR foams can be controlled closely by the foaming temperature. The increase of the foaming temperature led to different results compared to those from the increase of the water hyacinth and blowing agent content. Furthermore, it can be clearly observed that the NR foam filled with 10 phr of water hyacinth containing 4 and 6 phr of blowing agent at thickness of 13 mm foamed at 170°C, exhibits superior sound properties than NR foam produced at lower foaming temperatures. The results suggested that the suitable condition gave NR foams with bigger cell size, better cell distribution, and good compression deflection test, resulting in, the increase in α-value and NRC supporting the foaming efficiency results.

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