UNIVERSITI TEKNOLOGI MARA

EFFECT OF TREATED EGGSHELLS (tES) ON CURE CHARACTERISTIC, PHYSICAL AND MECHANICAL PROPERTIES OF ACRYLONITRILE BUTADIENE RUBBER (NBR) COMPOSITES

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

EFFECT OF TREATED EGGSHELLS (tES) ON CURE CHARACTERISTIC, PHYSICAL AND MECHANICAL PROPERTIES OF ACRYLONITRILE BUTADIENE RUBBER (NBR) COMPOSITES

One of the biggest biomass sources around the world is poultry waste that is eggshell waste. This eggshells comes from food waste that produces largely among food industries like bakeries, food restaurant and street food stall every day. This waste still becomes one of the highest food restaurants. Further research to utilized calcium carbonate derived from eggshells (ES) as possible filler to replace other natural filler in order to reduced environmental problem, provide substitution of synthetic filler with natural filler. Characterization of carbonized molasses is observed by using FTIR. The mechanical and physical test such as cure characteristic, tensile properties, elongation at break, tensile modulus, hardness and swelling test had been carried out. Based on the data obtained, it was found that the tensile strength, swelling resistance, hardness and elongation at break has decrease as increasing in the ES loading in NBR composites. The optimum loading is at 10 phr ES where the highest result of tensile strength, swelling resistance, hardness and elongation at break observed. Hence, calcium carbonated derived from eggshells can be used in order to replace natural filler.