

**SYNTHESIS AND APPLICATION OF
DEPOLYMERIZED NATURAL RUBBER IN VALUE
ADDED PRODUCTS**

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By

NADARAJAH THARISHANAN

**Faculty of Animal Science and Export Agriculture
UvaWellassa University**

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ABSTRACT

Natural rubber (NR), which is usually obtained from the latex of the *Hevea brasiliensis* tree, is an entirely macro-molecule. Therefore, its processability is difficult. But depolymerized natural rubber (DPNR or liquid natural rubber) has more processability and it has a wide range of applications as raw material for adhesives, pressure-sensitive adhesives, sealing materials and caulking compounds. In addition, it has also been used as a reactive plasticizer for improving processing properties of solid rubber such as compounded rubber used in tyre production. So, a research was conducted to develop depolymerized natural rubber using redox method. First, natural rubber was depolymerized by adding different levels (0%, 2%, 4%, 6%, 8%, and 10%) of methyl ethyl ketone (MEK). Then the molecular weight was tested using an Ubbelohde viscometer. The sample showing the lowest viscosity was taken as the best treatment level for depolymerization. Then, different levels of it (2%, 4%, 6%, 8%, and 10%) was used as the processing aid to prepare tyre inner layer and they were compared with the control having 5% of commercial processing aid. The physical and mechanical properties such as modulus, tensile strength, elongation at break; tear strength, hardness, and resilience were determined. The results reveal that, the lowest molecular weight (M_n ? 116000) is with the 4% MEK level and it is the best level for depolymerization under redox method. Then the 2% DPNR shows significantly better performances as a processing aid in tyre inner liner formulation. So, it can be concluded that, 4% of MEK can be used to depolymerize natural rubber and 2% DPNR can be used to prepare tyre inner layer instead of commercially available processing aid.

Key words: natural rubber (NR), depolymerized natural rubber (DPNR), methyl ethyl ketone (MEK), processing aid, tyre inner layer