TITLE	EFFECT OF MASTICATION TIME ON THE LOW STRAIN PROPERTIES OF SHORT PINEAPPLE LEAF FIBER REINFORCED NATURAL RUBBER COMPOSITES
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ABSTRACT

Pineapple leaf fiber (PALF), used as a reinforcing agent, does not have good adhesion to natural rubber (NR) due to the difference in their polarities. As a result, the degree of reinforcement of NR imparted by PALF remains low compared to that in a polar rubber like acrylonitrile butadiene (NBR). One of the factors that determines the adhesion between the rubber and the reinforcement is the rubber molecular weight. Thus, the aim of this paper is to demonstrate that the stress at very low strains of short pineapple leaf fiber (PALF) reinforced natural rubber (NR) can be significantly increased by lowering the matrix molecular weight. This can be achieved by increasing the matrix mastication time. The composites studied here contain a fixed amount of PALF at 10 part (by weight) per hundred rubber (phr). The PALF fibers were both untreated (UPALF) and sodium hydroxide treated (TPALF). Mastication times of 2, 4, 8 and 16 min were used. Stress-strain curves of PALF reinforced NR prepared with different mastication times were then compared. The most affected region of the curve is in the low strain region. The slopes of the stress-strain curves (moduli) increase with increasing mastication time, indicating better fiber-rubber interaction. The maximum stress achieved at 10% strain is almost 370% that obtained with the usual short mastication time (2 min). The effect remains up to very high strains, although becoming smaller as the strain is increased. Hence, we demonstrate that, by using long enough mastication time, stress-strain curves and stress at low strain of PALF reinforced NR can be improved without the need of any other adhesion promoters.