

Characterization of the natural rubber from new clones: RRIM 926 and RRIM 937

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The natural rubber (NR) has innumerable applications in a broad range of industrial sectors, being considered a product of great commercial interest. Although it is present in more than 2500 plant species [1], the *Hevea brasiliensis* is the only one that allows exploitation in commercial level. Current data show that the NR consumption in Brazil is higher than its production, which sets scenery for the development of researches on new clones that contribute to the increase of the production and the quality of the produced material. Thus, this work aims to show the obtained results of the NR properties produced by the new clones RRIM 926 and RRIM 937 and the clone RRIM 600 (control), collected in the Center of Rubber Tree and Agroforestry Systems located in Votuporanga-SP. The NR was evaluated by Wallace plasticity (P_0), plasticity retention index (PRI), nitrogen (%N) and acetonic extract percentage (%AE) using the technical standards NBR ISO 2007, NBR ISO 2930, NBR ISO 1656 (adapted) and NBR 11597, respectively. Thermogravimetric analysis (TGA) was carried out using equipment Q500 of TA instruments, with heating rate of 10°C/min, from room temperature up to 700 °C in inert atmosphere. The results of the NR properties are shown on Table 1. According to the results, all the clones presented P_0 higher than control clone and the minimum (30) set by the standard (NBR ISO 2000), indicating that these clones have polymer chains longer than the control clone. In regards to PRI, all the clones were below the minimum value set by the standard, 60, (NBR ISO 2000), and the clone RRIM 937 presented the biggest variation. From %N is possible to get an indicative of proteins, aminoacids and nitrogenated bases that are present in NR [2]. All the clones presented average value above the one set by the standard that considers one NR of quality when it has nitrogen percentages below of 0.6% (NBR ISO 2000). %AE consists of non-rubber substances present on NR, in which the lipids are the main constituents. Only RRIM 937 presented values above of set by the standard (3.5%) (NBR ISO 2000). TG curves of the clones have only one large plateau and the DTG curve has one primary degradation peak, indicating that thermal degradation of the raw natural rubber from these clones is mostly a one-stage process. The NR of the new clones presented good thermal stability up to 275 °C (T_i), and final temperature (T_f) of thermal decomposition process was about 460 °C for all the clones. Temperature variation ($T_f - T_i$) is considered the interval of the thermal decomposition reaction, and the smaller this interval is more stable is the material [4]. Therefore, the new clones and the control clone presented similar behaviors. The results indicated that the new clones evaluated are promising, but require further studies.

Table 1: Average and standard deviation of the NR properties of the new clones and the control

Clone	P_0	PRI	% AE	% N
RRIM 600	53±2.5	52±3.4	2,7±0.22	0.76±0.07
RRIM 926	66±3.1	52±8.8	3,0±0.03	0.76±0.04
RRIM 937	56±2.9	49±11	4,0±0.18	0.81±0.09

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