

VARIABILITY IN QUALITY AND MOLECULAR BREAKDOWN BEHAVIOUR OF SKIM RUBBER

K.T. Thomas, N.M. Mathew and Joy Jacob

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Skim rubber samples from four processing units were analysed for raw rubber properties. Molecular breakdown characteristics were studied using a torque rheometer. Both skim crepe and skim block were employed for the studies. Skim rubber showed higher level of inconsistency in raw rubber properties, except for Wallace plasticity. Plasticity of skim rubber was found to be the major factor influencing energy consumption during initial breakdown. The rate of breakdown of skim blocks was higher than that of skim crepe. Plasticity retention index was found to be inversely related to the initial rate of breakdown. The effect of peptiser was found to be less in skim rubber compared to ISNR 5.

Key words : Molecular breakdown, Raw rubber properties, Skim rubber, Torque, Totalised torque.

N.M. Mathew (for correspondence), K.T. Thomas, Rubber Research Institute of India, Kottayam - 686 009, India, and Joy Jacob, Department of Processing and Product Development, Rubber Board, Kottayam - 686 009, India.

INTRODUCTION

Skim rubber is obtained by the coagulation of skim latex, the secondary fraction of natural rubber latex, from the centrifugal concentration process. In spite of its light colour and lower dirt content, the inconsistency in its properties has been pointed out as a serious shortcoming (Bristow, 1990). The ageing properties of skim rubber are inferior (Baker, 1957) and the higher non-rubber constituents, especially the proteins, may lead to hygroscopicity in vulcanizates (Thomas and Jacob, 1967). Though many attempts have been made to upgrade the quality of skim rubber (Morris, 1954; Sethu, 1964; Ong, 1974), the processes suggested were mostly not cost effective. However, the low dirt content, light colour and low price of skim rubber make it an attractive material for the manufacture of general purpose rubber

products. Blends of skim rubber with latex grades of natural rubber were found to give vulcanizates showing better dynamic properties (Knight and Ian, 1975). The inconsistency in properties of skim rubber may be attributed mainly to the processing conditions and the variability of the raw material (field latex). Skim latex has a lower DRC (5-10%) and a higher proportion of non-rubber constituents. It is usually coagulated with sulphuric acid. Period of maturation of the coagulum, quantity of acid used, etc. vary from one processing unit to another.

The present study was taken up to assess the extent of variability in raw rubber properties and molecular breakdown behaviour of skim crepe. In India, skim rubber is processed and marketed as crepe while in most other rubber producing countries, it is processed as block rubber and hence the properties of skim crepe were