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STUDIES OF THE PREPARATION OF LIQUID
NATURAL RUBBER AND ITS VULCANISATION PROPERTIES

by

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ABSTRACT

Investigations were made on the methods of preparation properties and methods of vulcanisation of liquid natural rubber (LNR). For the preparation, the thermal oxidative degradation method based on phenylhydrazine/oxygen was found to be more effective than the photosensitised oxidative degradation method. A more detailed study of the thermal degradation process showed that, in addition to the known parameters influencing the degradation of natural rubber latex, the age of the starting latex and the reaction temperature also affect the extent of rubber degradation. LNRs prepared showed viscosity increases during storage. Study on the causes of this viscosity increase suggested that intermolecular crosslinking was responsible, with 60-70% of the crosslinks came from recombination of residual free radicals, and the rest came from "storage-hardening" type of reaction. Investigation on the vulcanisation behaviour of LNR showed that none of the methods employed could produce strong LNR vulcanisates. Sulphur vulcanisation using Zinc Diethyl dithiocarbamate (ZDC) as the accelerator, however, was found to give the best vulcanisate properties.