

THE INFLUENCE OF MASTICATION AND AGEING ON GEL CONTENT OF NATURAL RUBBER

Čadek D.¹, Foitlová A.¹, Kuta A.¹

¹ *Department of Polymers, University of Chemistry and Technology, Prague, Technická 5, 166 28, Praha 6, Czech Republic*

Natural rubber is one of the most important raw materials in the rubber industry. From a chemical point of view, natural rubber is cis-1,4-polyisoprene (about 92%) and the rest consists of non-rubber components (proteins, phospholipids, carbohydrates, dyes,...). These ingredients give it unique properties that set it apart from synthetic rubbers. However, their content depends on the conditions of growing rubber trees, the collection of latex and its processing into dry rubber.

Another factor influencing the properties of natural rubber is the gel content. The gel is considered to be an insoluble part of rubber in a suitable solvent, which is formed due to the interactions of non-rubber components with polyisoprene chains. Its content depends not only on the method of determination used (each gives different results) but also on the composition, age and method of storage of the rubber. In this work, rubber samples were subjected to mastication on a two-roll mill and in an internal mixer and ageing in an air oven. Masticated and aged samples were subjected to a series of analyses, like analytical, mechanical (green strength) or rheological (Mooney, RPA). After mixing the rubber samples with curatives vulcanization characteristics of rubber mixtures and mechanical properties of vulcanizates were evaluated.

This work aimed to evaluate the effect of mastication and ageing of rubber on the gel content and its effect on the properties of rubber, mixtures and vulcanizates.