INFLUENCE OF COAGULANTS TO THE PRODUCTION OF CUP LUMP AND STANDARD THAI RUBBER (STR20) ON THE PROPERTIES OF RUBBER

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Abstract

The STR rubber from the production factory in the northeastern provinces of Thailand. It is due to the fact that some of the suppliers of rubber coagulants add sulfuric acid in the cup lump process, resulting in high levels of sulfate residues in rubber, which is becoming a new problem affecting the rubber industry in these provinces. Moreover, the acid has an impact on the properties of rubber, the health of workers in the rubber plantation and place to purchase, including the problem of bad-smelling serum water down the road and causing trouble to the road users and the community. If the problem happens, the damage in the country is observed. The cup lump coagulants of 16 samples, selected by a random sampling, from the northeastern provinces of Thailand were analyzed by the ion chromatography method. The results demonstrate that the cup lump coagulants of 8 samples containing sulfuric acid and of 5 samples containing calcium chloride were detected, accounting for 50% and 31.25% of total samples, respectively. Rubber cup lump contains sulfuric acid and calcium chloride. It results in the rubber latex such as viscous gum, dark color, high viscosity, resistance to low deterioration and high moisture. The 5 samples of coagulants were selected to represent all of the rubber coagulants, i.e. 1) coagulants with single formic acid, 2) coagulants with single sulfuric acid, 3) coagulants with single calcium chloride, 4) coagulants mixing between sulfuric acid and calcium chloride, and 5) coagulants mixing between formic acid and calcium chloride. The cup lump was prepared by practical method in the rubber plantation. It was prepared to dry rubber, grinding and drying in order to analysis the properties of rubber such as raw rubber, rubber compound and rubber after vulcanization. The results from analyzing the properties of rubber prove that the coagulant with formic acid is consistent with the STR20 standard. The properties of raw rubber, coagulated by coagulants containing between sulfuric acid and calcium chloride tend to have the value of volatile or volatile matter and ash content, exceeding the standard. In addition, Original Wallace Plasticity (PO) is lower than the STR20 standard. From analyzing the rubber compound, coagulated by coagulants containing formic acid, the mechanical properties of rubber such as tensile strength, modulus of 100%, 300% and 500%, respectively, were obtained. It is higher than coagulated by coagulants containing between sulfuric acid and calcium chloride.