

**A NOVEL METHOD TO MANUFACTURE SKIM CREPE RUBBER
WITH LOW NITROGEN CONTENT USING SKIM LATEX
TREATED WITH PINEAPPLE JUICE**

A dissertation submitted to the
Faculty of Animal Science and Export Agriculture
Uva Wellassa University

In partial fulfillment of the requirements for the award of
Bachelor of Science in Palm and Latex Technology & Value Addition

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**Palm & Latex Technology and Value Addition Degree
Programme**

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2018

ABSTRACT

Skim Natural Rubber Latex (SNRL) is a by-product obtained during the manufacture of centrifuged latex, contains low dry rubber content (<5%). Direct coagulation of SNRL with concentrated sulfuric acid is the conventional method used to manufacture Skim Crepe Rubber (SCR). SCR fetches a low market value due to its inferiority in quality inherited by the presence of higher non-rubber content compared to that in other raw rubber types. This study focused to develop a healthier and environmental friendly manufacturing process for SCR with lower nitrogen content and higher quality through removal of protein. In first method SNR Latex creamed for 36 hours, the SNR latex cream was separated, then acid was added to the pH adjustment, finally pineapple juice (PAJ) added & kept for coagulation. In second method, PAJ was initially treated with Potassium oleate before it was mixed with SNRL (15ml of PAJ was added to 1L of SNRL) and kept for 48 hours at room temperature (28 °C). Then a creaming agent was added at 25 phr to PAJ treated SNRL after adjusting pH to 7.5 and creamed for 36 hours. Three different acidic coagulants of 20% (w/w): sulfuric, oxalic and formic acid were employed to coagulate deproteinized creamed fraction. The control sample of SCR was also prepared by adding 20% (w/w) sulfuric acid to fresh SNRL. Raw rubber properties and physico-mechanical properties were evaluated according to the ISO standards. All SCR samples prepared by using creaming followed by the PAJ treatment have low nitrogen content (0.30 – 0.40% w/w) and Mooney viscosity (85 – 92 MU) along with higher ash content (0.4 - 0.5% w/w) than the control sample where above parameters were 1.44% (w/w), 91.55MU and 0.17% (w/w) respectively. It was found that total acid requirement could be reduced by 50 % using novel method. Also deproteinized SCR manufactured using oxalic acid as the coagulant has highest Plasticity Retention Index (61.17%) with good initial Plasticity. Hardness and tear strength are increased and tensile strength is decreased in control sample. But there is no any significant effect on compression in other samples. Therefore this method might be a good solution for removal of protein substances and unfavorable metal ions from SNRL enhancing the quality of SCR. Thus, this novel method would allow to obtain a better competitive commercial value for SCR.

Keywords: Creaming, Deproteinization, Pineapple juice treatment, Skim natural rubber latex