

A Novel Method to Manufacture Skim Crepe Rubber with Low Nitrogen Content using Pineapple Juice Treated Skim Latex

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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. Pineapple juice (PAJ) was initially treated with Potassium oleate before it was mixed with SNRL (15 ml of PAJ was added to 1 L of SNRL) and kept for 48 hrs 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 were evaluated according to the ISO standards. All SCR samples prepared by using creaming followed by the PAJ treatment have low nitrogen content (0.300.40% w/w) and Mooney viscosity (7590 MU) along with higher ash content (0.4-0.5% w/w) than the control sample where above parameters were 1.44% (w/w), 91.55 MU 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. This method might be a good solution for removal of protein substances and unfavourable metal ions from SNRL enhancing the quality of SCR. Therefore, this novel method would allow to obtain a better competitive commercial value for SCR.

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