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SUPERIOR PROCESSING RUBBER FROM RADIATION CROSS-LINKED NATURAL RUBBER LATEX

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Superior processing (SP) natural rubber was prepared by blending different proportions of fresh and radiation vulcanised natural rubber latex, followed by coagulation and drying. The Mooney viscosity of SP rubber increased as the proportion of cross-linked rubber increased. Cross-linked and uncross-linked rubber blended in 20/80 proportion (P20) recorded very good mechanical and processing characteristics compared to pure NR. The better processing characteristics were attributed to the higher viscous nature of the modified rubber in gum and carbon black filled mixes. It was observed that the P20 rubber had a higher level of vulcanisation than the pure NR. The improved processability and vulcanisation characteristics were ensured from the analysis of viscoelasticity cure characteristics, physical property evaluation and filler dispersion characteristics. Blending of fresh natural rubber latex and radiation vulcanised latex in suitable proportions offer a very simple method to produce SP rubber with enhanced processing characteristics and mechanical properties.

Keywords: Radiation vulcanisation, Natural rubber latex, Processing rubber, Viscoelasticity.

INTRODUCTION

The latex which is called prevulcanised latex became indispensable for the manufacture of latex products like toy balloons, Rubber band, gloves, latex foam etc. Later an application of this cross-linked latex as a process aid (called superior processing rubber) in the form of dried rubber after coagulating the latex blend of uncrosslinked and cross linked latex was explored. (Karunaratne and Fernando, 1985). The Superior Processing (SP) rubber consists of well mixed vulcanised and unvulcanised rubber. They can be compounded in the manner similar to ordinary grades of natural rubber, with better processing properties. (George *et al.*, 2000). Generally there is little loss of physical properties of the final vulcanisate but they show improved processing characteristics and ability to retain dimensional stability. The SP rubber is prepared using latex cross-linked by sulphur and accelerators in the latex stage. Field latex suitably compounded with the various compounding ingredients is steam heated using a water bath to the desired level of crosslinking, cooled and then intimately mixed with the required quantity of fresh field latex. The blended latex is coagulated with acid.

NR latex can be cross-linked by exposure to gamma radiation in presence of suitable sensitizers. The latex is called

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