STABILITY AND VULCANIZATION CHARACTERISTICS OF ENZYME DEPROTEINIZED NATURAL RUBBER LATEX

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The colloidal stability of enzyme deproteinized natural rubber latex (EDPNRL) was investigated in comparison with the conventional high ammonia (HA) latex. The colloidal stability of EDPNRL was improved by the addition of potassium hydroxide or a combination of potassium hydroxide and ammonium laurate during compounding. The vulcanization characteristics of EDPNRL were compared with HA latex in a conventional sulphur system using zinc diethyldithiocarbamate (ZDC) as primary accelerator and ZDC in combination with other accelerators namely zinc di-n-butyldithiocarbamate (ZDBC), zinc dibenzyldithiocarbamate (ZDBEDC) and activated dithiocarbamate (Setsit-5). The compounds of EDPNRL with ZDC, ZDBC and their combinations were fast curing. The mechanical properties and ageing resistance were within the limits specified for dipped goods.

Key words: Accelerators, Chemical stability, Colloidal stability, Enzyme deproteinized natural rubber latex, Mechanical properties, Vulcanization characteristics.

INTRODUCTION

The use of natural rubber latex products has been facing serious challenges owing to the allergic effects of some of the extractable proteins (EP) present in it (Pendle, 1994). Several techniques are being adopted for manufacturing products with very low EP content. Low protein latex is one of the important requirements for this. NR latex contains 2 to 3 per cent proteins. Only a part of the soluble proteins are removed by centrifuging the latex. The proteins inherently associated with the surface of the rubber particles cannot be removed by this process (Blackley, 1997). Several methods such as multiple centrifugation and enzyme treatment have been adopted for removing the rubber particle bound proteins. Enzyme treatment involves a combination of digestion with a proteolytic enzyme, displacement of adsorbed proteins using a surfactant and the subsequent purification of the treated latex by centrifugation or creaming. Treatment with a proteolytic enzyme (Anilozyme-P) was reported to produce latex with low protein content in a single centrifuging process (George *et al.*, 2001). The physiochemical properties and the vulcanization characteristics of the enzyme deproteinized natural rubber latex (EDPNRL) are likely to be influenced by the extent of protein removal.

In this study, the colloidal stability of EDPNRL was compared with HA latex. EDPNRL was used in the manufacture of dipped products through modified com-

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