PREPARATION OF DEPROTEINISED NATURAL RUBBER USING A NOVEL PROTEOLYTIC ENZYME

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Proteolytic enzymes are commonly used as a hydrolytic agent for the reduction of protein content in natural rubber (NR). In the present an attempt has been made to standardize a method to reduce the protein content of NR latex using a novel proteolytic enzyme. The NR latex was treated with very small quantities of the enzyme and then creamed for six hours. The cream portion was removed and coagulated and this rubber had nitrogen level similar to conventional deproteinised natural rubber (DPNR), but with higher initial plasticity (P_0) and plasticity retention index (PRI). Though the technological properties of the DPNR produced were slightly low, they were well within the process limits. The advantage of this method is production of DPNR with better properties in a short period of time.

Key words: Deproteinisation, *Hevea brasiliensis*, Latex creaming, Natural rubber latex, Plasticity retention index, Proteolytic enzyme

INTRODUCTION

Presence of non-rubber components especially certain proteins in natural rubber (NR) can cause allergy to some people using NR products (Aprem, 2002; Boonme *et al.*, 2014). Vulcanized NR has very high tensile strength, modulus and resilience and hence is used for making large number of latex and dry rubber based products (Ma'zam *et al.*, 2002). Though NR exhibits very good dynamic mechanical properties, this can be further improved by removal of the proteins present in it (Tanaka *et al.*, 1992; Sansatsadeekul *et al.*, 2011). This modification also imparts lower water absorption and better resilience properties (Boggs *et al.*, 1937). There are many engineering applications where water absorption needs to be lower together with stringent dynamic mechanical properties such as lower creep and stress relaxation (Ariyawiriyanana *et al.*, 2013). In such applications, deproteinised NR, is a better choice than the conventionally prepared NR though the plasticity retention index (PRI) is generally low for conventional DPNR (Pichayakorn *et al.*, 2012).

DPNR is a purified form of NR with very low nitrogen (N) and ash contents (George *et al.*, 2000). The special virtue of DPNR products is their low water absorption and electrical stability, which are highly relevant for under water applications (George *et al.*, 2001). DPNR based products offer reduced creep and precision modulus that enable them to be used in engineering applications. Physical or chemical means are common for

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