LATEX BLENDS OF NATURAL RUBBER AND NITRILE RUBBER WITH CHLOROPRENE RUBBER

Improvement in Compatibility and Properties

by

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Certificate of Originality

This dissertation contains no material which has been submitted for the award of any degree or diploma in any university, or any material previously published by another person unless due reference to the material is made.

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BCA	-	bicinchoninic acid
BSA	-	bovine serum albumin
Cellosize QP	-	hydroxy ethyl cellulose
Dispersol LR	-	disodium methylene dinapthalene sulphonate
Foam-master	-	polydimethyl siloxane
SDS	-	sodium dodecyl sulphonate
Teri QN-40	-	trimethyl ammonium bromide
Triton X-100	-	octyl phenoxy polyethoxy ethanol
Vulcastab TM	-	aqueous paste of cetyl trimethyl ammonium bromide
Wettem	-	non-ionic stabilizer of the ethylene oxide condensate type
ZDEC	-	zinc dimethyl dithio carbamate

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Abstract

Latex is a colloidal dispersion of a polymer substance in an aqueous medium. Latex blends of natural rubber (NR) and several synthetic rubber latices (e.g. chloroprene rubber (CR), nitrile rubber (NBR), styrene butadiene rubber (SBR) etc.) have been used extensively for manufacturing various rubber products including foam rubber and gloves. In NR/NBR latex blend interfacial tension between NR and NBR is very high due to the differences in polarities of the two latices. Therefore the compatibility and hence the miscibility of NR/NBR latex blend is low.

In this study an attempt was made to use CR latex as a compatibilizing agent in NR/NBR latex blends. Using FT-IR spectra it was found that addition of CR latex to NR/NBR latex blend has caused a chemical shift. Hence the properties of NR/NBR latex blend and NR/CR/NBR latex blend were studied. It was found that the tensile strength of NR/CR/NBR latex blend is greater than NR/NBR latex blend. Further the solubility parameter of CR latex was found to be between NR and NBR. Hence it was found that CR latex can be used to improve the strength and miscibility of NR/NBR latex blends. The effect of addition of CR latex on other properties of NR/NBR latex blend (water extractable protein content and oil resistance) were studied and it was found that there was no adverse effect on those properties with the addition of CR latex to NR/NBR latex blend. Therefore it can be concluded that CR latex can be used as a suitable compatibilizing agent in NR/NBR latex blend.