

SUMMARY:

Natural rubber being an unsaturated polymer is very reactive towards a variety of reagents. It is susceptible to oxidation in the presence of heat, light Ozone etc.

The history of origin of liquied rubbers obtained from natural rubber oxidation is not far back, and the use of solar energy in the preperation of liquid rubbers are more attractive since solar energy is the most free and a vast source of energy available in the tropics.

In the present work the effect of nitrobenzene, substituted nitrobenzene, benzophenone, ferrous acetyl acetate, cobalt acetyl acetate and different photo-sensitizers on the degradation of raw natural rubber was studied to find, an effective reagent and conditions to produce liquid natural rubber.

The depolymerised natural rubber obtained by solar irradiation of raw rubber with 2% w/w nitrobenzene was suffering many disadvantages, mainly the increase in molecular weight on storage. Attempts were made to prevent this storage hardening and to understand the chemical reaction based on the hardening process, and the experiments were successful to a certain extent.

Modifications of depolymerised natural rubber were done by performing epoxidation reaction and reacting it with amines with the view of binding the amine grouping

to the epoxy polymer. Antioxidant activity of the newly prepared antioxidant was compared with that of IPPD, by performing typical tests.

Studies were also carried out with model olefins such as methyl cyclo hexene and cyclo hexene with these activators in the presence of UV light. The analysis, carried out showed that several oxygenated products such as alcohols and ketons are produced during the exposure to UV light. Of these compounds used as activators nitrobenzene was found to be most effective in bringing about chain scission of natural rubber, which leads to the formation of liquid natural rubber.