

3736816 SCPO/M : MAJOR: POLYMER SCIENCE; M.Sc. (POLYMER SCIENCE)

KEY WORD : ACRYLATED ELASTOMER, PHOTOCALORIMETRY, UV RADIATION, EPOXIDISED LIQUID NATURAL RUBBER

SAYAN DUANGTHONG : STUDY OF PHOTOCROSSLINKABLE SURFACE COATING BASED ON ACRYLATED LIQUID NATURAL RUBBER.

THESIS ADVISOR : PRANEE PHINYOCHEEP Doctorat de l' Université du Maine, KRISDA SUCHIVA, Ph.D., SAUVAROP LIMCHAROEN, Dr.rer.nat. 155 p. ISBN 974-588-948-2

Low molecular weight epoxidised liquid natural rubber (ELNR) was prepared by depolymerization of natural rubber in the latex phase using phenylhydrazine/O₂ system, followed by in-situ performic acid epoxidation. Parameters affecting epoxide ring opening reaction by acrylic acid were studied by infrared spectroscopy and potentiometric titration. It was found that the concentration of the acid and the reaction temperature had influences on the rate of reaction and percent conversion.

The acrylated ELNR (AELNR) was found to undergo a fast crosslinking-polymerization when it was exposed to UV irradiation in the presence of photocleavage initiator (Irgacure 184 and Darocur 1173) and liquid diacrylate monomer (HDDA and TPGDA). The cure kinetics of the elastomers was studied by monitoring the exothermal heat of photocuring of acrylate double bond using double beam photocalorimetry accessory (DPA7). The diacrylated monomer, photoinitiator concentration and the molecular weight of AELNR were found to play an important role on the rate and extent of the reaction, as well as on the properties of cured film such as hardness and adhesion.