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NONGNUCH CHIRAPHAPHISARN : A STUDY OF THE PROPERTIES OF LIQUID RUBBER FILLED EPOXY RESIN. THESIS ADVISOR : PRANEE PHINYOCHEEP Doctorat de l' Universite' du Maine, FREDERICK H. AXTELL Ph.D., F.I.M., KRISDA SUCHIVA Ph.D. 155 p. ISBN 974-589-016-2

This study involved an investigation of the effect of type and content of liquid rubbers, and type of curing agent on the properties of the epoxy resin. Epoxy resin cured with 4, 4' diaminodiphenylmethane(DDM) / 4, 4' diaminodiphenylsulfone (DDS) were blended with liquid rubbers (carboxy terminated butadiene acrylonitrile (CTBN), liquid natural rubber (LNR) and epoxidized liquid natural rubber (ELNR)). The impact strength, glass transition temperature (T_g) and the morphology of the blends were examined by Izod impact testing, dynamic mechanical thermal analyser (DMTA) and scanning electron microscopy (SEM), respectively.

The results obtained indicated that the liquid rubbers used (CTBN, ELNR, LNR), could not improve the impact strengths of the epoxy resins cured by both DDM and DDS. The possible reasons were that liquid rubbers acted as defects in the epoxy resin matrix as the results of the large difference in viscosity between epoxy resins and the uncrosslinked liquid rubbers. Modifications of the epoxy matrix by liquid rubbers possibly occurred as were evidence by DMTA data. The fracture surfaces of liquid rubber modified epoxy resins as examined by SEM revealed poor adhesion between the epoxy and the rubber phases which supported the impact strength results.