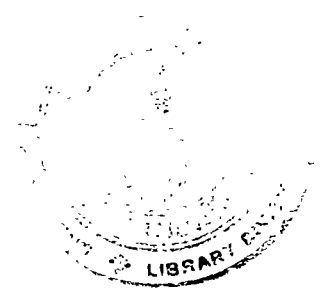


PREPARATION AND PROPERTY STUDIES OF POLYBLENDS OF NATURAL RUBBER
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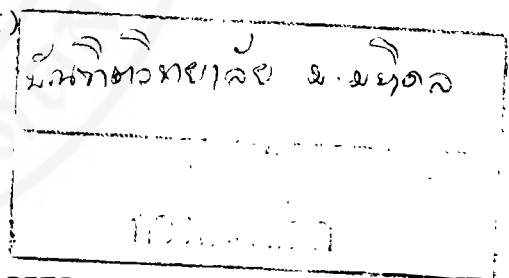
BY

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ABSTRACT

Polyblends of natural rubber and polystyrene having the polystyrene contents of 20,30,40 and 50 weight % were prepared by latex mixing method. Evidences from Differential Scanning Calorimetry, Dynamic Mechanical Analysis and Electron Microscopy indicated clearly that blends of all composition exhibited two-phase morphology. Polyblends obtained fresh after drying off water were found to exhibit far inferior mechanical properties to those of mould samples, except for tensile strength. The results could be explained based on electron microscopic evidences that the latter possess smaller polystyrene aggregates which were uniformly distributed than the unmould samples. Properties of blends were found to be time-dependent with equilibrium properties being reached within approximately one week from the time of the preparation.

For the moulded polyblends, hardness, yield strength and tensile strength increased with increasing polystyrene content in the expected manner but elongation at break was lowered. The results obtained showed large improvement in properties over those of uncrosslinked rubber when polystyrene was incorporated into the rubber, except for permanent set property which was still quite inadequate for the blends. Efforts were made to reduce permanent set, thus improving elastic property, by partial crosslinking the

rubber phase with various quantity of sulphur . Some improvement was observed depending on polystyrene content and the level of sulphur used. In general, the extents of improvement were still unsatisfactory except for blends that contain 20 % polystyrene. However, tensile properties of blends of partially vulcanised natural rubber were significantly increased compared to those of their unvulcanised counterparts. Further work is in progress to improve elastic property of polyblends by the use of compatibilising agents.