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AM-ORN RUENRENGKAN: A STUDY TO IMPROVE  
CHARACTERISATION OF PREVULCANISED NATURAL RUBBER LATEX.

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The present thesis is concerned with the study of the application of the phase transfer technique to characterise the extent of vulcanisation actually occurring in the particles of natural rubber latex. The study was conducted using both sulphur vulcanisation, and  $\gamma$ -ray vulcanisation, of natural rubber latex.

The study showed that the phase transfer technique can be used as a novel method for monitoring vulcanisation of natural rubber latex, by sulphur or by  $\gamma$ -radiation, including direct measurement of the degree of crosslinking in the rubber particles. The method successfully developed can be used to develop or improve vulcanisation process of rubber latex. Additional evidence was obtained to suggest that physical entanglement of the rubber molecules is important for determining several properties of solid film or sheet derived from the vulcanised latex, such as the value of gel content and tensile properties particularly at small strain. A model of the structure of crosslinked rubber particles vulcanised by sulphur vulcanisation and  $\gamma$ -ray vulcanisation was proposed which might provide an explanation for the poorer tensile properties of natural rubber latex vulcanised by  $\gamma$ -radiation compared to sulphur vulcanised natural rubber latex.

Additional studies were also made on sulphur vulcanisation and  $\gamma$ -ray vulcanisation of natural rubber latex, which provided some useful information for further development of both methods of vulcanisation of natural rubber latex.