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THITIPORN TANUNCHAI: A STUDY OF  $\gamma$ -RADIATION VULCANISED NATURAL RUBBER AND SKIM LATICES FOR ENCAPSULATION OF UREA FERTILISER. THESIS ADVISORS: PRAMUAN TANGBORIBOONRAT, Ph.D., ARUNEE TABTAING, Ph.D., 132 p. ISBN 974-662-260-9

$\gamma$ -Radiation vulcanised natural rubber (RVNR) latex was used for encapsulation of urea fertiliser by applying the acid precipitation technique. For all RVNR matrices irradiated with various doses, 76% of urea could be incorporated in the capsule. Increase of crosslink density of the rubber matrix caused an increase in the amount of urea released from both the uncoated urea-RVNR capsules and the capsules coated with calcium alginate. SEM micrographs indicated the phase separation between the capsule matrix and urea particles when the rubber was highly vulcanised. Moreover, the presence of coating agent effectively reduced the concentration of urea release and prolonged the duration as previously observed.

Skim latex was also studied for further attempt to use it as a capsule matrix. The latex was characterised before being concentrated by centrifugation and creaming. The centrifugation did not provide the separation of skim latex whereas creaming with 4% of sodium alginate from 15 to 45 phr could increase solid content in the upper cream phase of 12% (w/w) for 3 days. Effect of creaming time and sodium alginate concentration on the particle size distribution, nitrogen content and quantity of charge on latex particle of the creamed skim latex were investigated. The urea-skim NR capsules were then prepared by co-precipitating the mixtures of the creamed skim latex and urea into a hardening solution (2% CaCl<sub>2</sub>). The rate of urea release and capsule morphology were finally studied.