



CHAPTER V

CONCLUSION

The slow released fertilizer was prepared by coating with cardanol. The properties of cardanol were improved by prepolymerization or applying a mixture of cardanol that was processed through polymerization with drying oil or condensation between cardanol and formaldehyde. Comparing the properties with various cardanol films such as drying time, hardness, adhesion, gloss, water resistant, and acid-base resistant it was found that films from cardanol-tung oil showed the fastest drying time, further it was compact, glossy and water resistance. From the above data, the film from cardanol-tung oil was effective material for coating water-soluble fertilizer. Cardanol-tung oil ratio of 9: 1 has less drying time at 80 °C. This process observed that the optimum of cardanol-tung oil were 6% of weight fertilizer, 6% Cobalt naphthenate and 6% *tert*-butylhydroperoxide as catalyst at 80 °C. The cardanol-tung oil coated fertilizer showed the slow release property. When thickness of cardanol-tung oil coating was increased, the releasing rate of urea decreased and increasing temperature resulted in increasing rate. Furthermore, high pH was found to decrease releasing rate of urea. For 52.63-71.01 micron of cardanol-tung oil coated fertilizer, urea relatively rapid release while 124.56, 175.44, and 230.70 micron coated fertilizer gives a slower and constant releasing rate. Further, it was found that the urea 175.44 and 230.70 micron start released increased at 35 day. However, urea fertilizer coated with cardanol-tung oil at thickness 124.56 micron appropriate for rice which was wanted nutrient within 1 month.

Suggestion for future work

According to this study, the urea fertilizer coated with cardanol-tung oil gave a good release property. The further study was to improve the method of coating and materials in order to save cost and energy by reducing an amount of cobalt naphthenate in the coating and using other low cost catalyst. Further, experiment in field test should be performed in order to investigate the effectiveness of the slow-release urea.