CHAPTER V

SUMMARY

1. Deproteinization of natural rubber by the coupling action of papain and microwave energy has been optimized at 25% DRC. Fresh field latex with 0.2% ammonia was added 0.15 phr hydroxylamine hydrochloride, 0.05 phr sodium metabisulfite and 0.05 phr Wingstay-L, pH 7.6 $\pm$ 0.1. Preheat the latex by microwave until latex temperature is 50^{o}C. Enzymatic treatment is by papain 0.3 phr for 5 minutes, dilute by water (latex: water = 1: 1) and steam coagulation. Coagulum was washed, shredded and dried.
2. Natural rubber was deproteinized by papain and microwave energy at the pilot scale 15 liter per day. This processing took about 8-10 hours, and 76.67% yield of solid DPNR at the cost of 29 Baht/kg.
3. The most important raw rubber property improved by this process is the nitrogen content of 0.2% max.
4. The limitation of new DPNR is its low initial plasticity (Po = 27) and plasticity retention index (PRI = 63%). These properties indicated that its processability required higher level of antioxidants and should be used for manufacturing of short-shelf life product.
5. The new DPNR is of allergen-free grade as confirmed by SDS-PAGE, EAST and SPT.
6. The prevalence of latex sensitivity study in Thai people indicated that the high-risk populations are general atopic healthcare workers as evident by 30% EAST positive followed by general atopic population with 8% EAST positive.
7. Alcalase is not used in this process because consumes more non-benefit chemical, self-coagulated, yielding hard and heterogeneous texture of rubber, and unsatisfactory orange-red color.