

CHAPTER V

SUMMARY

1. Deproteinization procedure can be accomplished from both of latex concentrate and field latex by the action of Alcalase and Papain.

1.1 Treatment of concentrated latex with Alcalase

Concentrated Latex 60% is diluted to 25% DRC with water and chemical additives and adjusted to pH 8-9 before treatment with Alcalase 0.3 p.h.r. at 50°C for 8-10 h. The digested latex is then diluted to 5% DRC and coagulated with 2% composite mixture of sulfuric and phosphoric acids. The coagulum is washed, creped and dipped in 2% thiourea solution before drying at 60°C.

1.2 Treatment of field latex with Alcalase or Papain

Fresh field latex is preserved with 0.4 p.h.r. ammonia and 0.9 p.h.r. of Triton X-100 and then diluted and adjusted to 25% DRC at optimal pH range, pH 8-9 for Alcalase and pH 7-8 for Papain, with water and chemical additives. The latex is treated with Alcalase 0.4 p.h.r. or Papain 0.3 p.h.r. at the same temperature of 50-60°C for 8-10 h or 2 h respectively. The digested latex is then coagulated with steam in an autoclave for 3-4 min and the coagulum is washed, creped and dried at 60°C. Only Alcalase treatment, the coagulum should be dipped in 2% thiourea solution before drying.

2. The maximum per cent nitrogen reduction by both enzymes are approximately 70-75% of starting amount and the CV-DPNR produced from concentrated latex 60% reveal the satisfactory raw rubber composition as % N less than 0.06 g% with the acceptable processibilities according to RRIM specification. The CV-DPNR produced from field latex possess higher but acceptable amount in raw rubber composition except ash content (>0.15 g%)

3. Concentrated latex 60% provide more advantage than fresh field latex in its consistency and lower in the initial amount of non-rubber impurities. While PB 5/51 is the most suitable clone for DPNR production because it exhibits the lowest raw rubber composition and lighter color from the initial step to the end of process.

4. Cure characteristic of DPNR in this formulation are not significantly different from non-enzyme treated rubber and independent on the clonal effect. But the cure rate of low nitrogen rubbers apparently increase in corresponding with the amount of %N retained in the rubber and 0.12 g% of nitrogen is the maximum value of %N to allow the high cure rate possibility.

5. The typical characteristics of DPNR vulcanizate are their higher stress-strain properties but slightly lower in hardness and 300% Modulus when compared with the non enzyme-treated rubbers.