

CHAPTER V

CONCLUSIONS

1. Water soluble proteins (WEP) in fresh field latex (FFL) show seasonal variation more or less parallel to %DRC, which starts at about 40% and decreased to 30% towards the end of tapping season, WEP of FFL starts about 70 mg/g rubber and decreased to 20 mg/g rubber at the end of tapping season.
2. Centrifugation can remove about 90% of WEP from FFL, so that concentrated latex (CL) 60% contains about 5 mg/g rubber of WEP during May-October, and 1-2 mg/g WEP in November-January.
3. Irradiation of FFL at low dose 1-10 kGy resulted in disintegration of water soluble latex proteins, in FFL and CL, where increasing doses 40-120 kGy disintegrate insoluble proteins bound to rubber particle resulted in increasing amount of WEP greater than in non-irradiated FFL.
4. Enzyme treatment of FFL digest both WEP and water insoluble proteins stabilizing the rubber particle, resulting in DPCL of low MST (≈ 200 sec), low nitrogen content ($< 0.09\%$), and low WEP ($82 \pm 28 \mu\text{g/g}$ rubber).
5. Combined treatment of enzyme deproteinization, centrifugation and 10 kGy irradiation of CL can not improve the low MST (250 sec) of DPCL-IRR indicating that small fragment of remaining peptide have no stabilizing effect on rubber particles, and was easily removed by leaching.
6. Alginate addition at 0.015 phr slightly increases recovery yield of rubber in CL, although retains more Mg, but reduces WEP of AGCL to $< 300 \mu\text{g/g}$ rubber, enough to maintain

to maintain normal MST as well as CCL and all ISO 2004 specification, including nitrogen content <0.20% slightly lower than CCL. Combination alginate addition with 10 kGy irradiation, is considered the high advantage because this treatment resulting in AGCL-IRR of MST > 1,000 sec, WEP <300 µg/g rubber, acceptable VFA (0.03-0.06 %) and Mg (70-86 ppm).

7. Leaching rubber film at the ratio 1 g rubber to 10 ml 70°C distilled water results in the removal of WEP significantly. Increasing leaching time from 10 minutes to 30 minutes, increases the efficiency of WEP removal from 3.30-89.69% to 58.00-95.18% reduction from no leaching. When leaching was performed with film prepared from AGCL-IRR, WEP remained was less than 50 µg/g rubber and confirmed by SDS PAGE and SPT that no band of major allergens protein of rubber film can be extracted after leaching.
8. In the absence of TMTD, irradiation of CL at low MST (200 sec) did not change the MST profile significantly comparing with non irradiated CL. On the other hand irradiation of latex where MST were about 800-900 sec or with rubber particle stabilizing proteins can increase MST about >1000 sec.
9. The radiation vulcanized rubber (CCL-IRR, DPCL-IRR and AGCL-IRR) show tensile strength not less than 7 MPa, 300% modulus 0.6-0.8 MPa, elongation at break 845-1015 % and tear strength 167-255 N/cm at thickness 0.2-0.3 mm which are comparable to commercial dental rubber dam except lower tear strength.