Chapter – 4

CONCLUSIONS AND SUGGESTIONS FOR FUTURE WORK

4.1 Conclusions

1. Using FT-IR spectra it was found that addition of CR latex to NR/NBR latex blend has caused a chemical shift. Therefore it can be concluded that with the addition of CR latex there could be some effect on compatibility of NR/NBR latex blends. The NR/CR/NBR (40:15:25) is the best composition.

2. There was no significant effect of mixing temperature on NR/CR/NBR latex blends.

3. Tensile strength of the film of NR/CR/NBR (40:15:25) latex blend is greater than that of the film of NR/NBR (40:40) latex blend.

4. Extractable protein content of the film of NR/CR/NBR (40:15:25) latex blend can be less than that of the film of NR/NBR (40:40) latex blend.

5. In gear oil (SAE 90), oil resistance of NR/CR/NBR latex blend is better than that of NR/NBR latex. For other oils tested NR/NBR latex blend exhibited more resistance. There is no adverse effect on oil resistance with the addition of CR latex to NR/NBR latex blend.

6. It was concluded that CR could be used as a compatibilizing agent on NR/NBR latex blends.

4.2 Suggestions For Future Works

1. The temperature effect for mixing was not that significant according to the results obtained in this study. It is suggested to check the effect of temperature using a wide range of temperature.

2. One might use the solubility parameter to further improvement of the compatibility. As the density is directly related to the solubility parameter by changing the densities of NR, CR, and NBR latices, one can further improve the compatibility of the best chosen mixture NR : CR : NBR (40 : 15 : 25).

3. It is suggested that to determine water extractable protein content of the films of NR/NBR, NR/CR/NBR latex blends and NR latex using another method (instead of BCA method) and identify the film which is containing the lowest water extractable protein content.

References :

1. Paul DR, Newman S. (1978). Polymer Blends,Vol-1. Academic Press, Inc., London; 1.
2. Karunanayake L. (1997) Blends of Polyvinyl Chloride with a Polyurethane produced in SITU. Ph.D. thesis, University of North London; 1-6, 347.
3. Jones KP, Tinker AJ. (1998). Blends of Natural Rubber. Chapman and Hall, London; 2-4, 53.
4. Rudin A. (1982). The Elements of Polymer Science and Engineering. Academic Press, Inc., London (Ltd.), London; 428.
5. Encyclopaedia of Polymer Science and Technology, Vol-5. Mark HF, Gaylord NG, Bikales NM. (1966). Interscience Publishers, a division of John Wiley and Sons, Inc., London; 459, 463, 844.
6. Sperling LH. (1986). Introduction to Physical Polymer Science. John Wiley and Sons, Inc., New York; 102-103.
7. Encyclopaedia of Polymer Science and Engineering, Vol-8. (1987). Mark HF, Gaylord NG, Overlor CG. John Wiley and Sons, New York.; 647-648.
8. Polymer Latices and their Applications. Calvert KO. (1982). Applied Science Publishers Ltd., London; 1-2, 11-13, 15.
9. Encyclopaedia of Polymer Science and Technology, Vol-11. (1969). Mark HF, Gaylord NG, Bikales NM. Interscience Publishers, a division of John Wiley and Sons, Inc., London; 620.
10. *Proceedings IRTC '93 Workshop on Latex Proteins.* Rubber Research Institute of Malaysia, Kuala Lumpure, Malaysia. (1993) ; 27-28.

11. Instructions BCA Protein Assay Reagent Kit. (1996). Pierce Chemical Company, Rockford, IL 61105, USA; 1-4, 6, 8.

12. Stern HJ. (1967). Rubber: Natural and Synthetic. Page Brothers (Nowich) Ltd, Great Britain; 106-107, 426, 463.

13. Barlow FW. (1988). Rubber Compounding. Marcel Dekker Inc, New York; 51-52, 76-80.

14. Patel MM. (1997). Nitrile Rubbers- A lecture delivered at the Plastics and Rubber Institute of Sri Lanka. Gujarat Apar Polymers Ltd., Chembur, Mumbai; 8, 21, 36.

15. Carl CJ. (1962). Neoprene latex. Elastomer Chemical Department, EI Du Pont De Nemours and Co., Inc, Wilmington, Dlawara; 1, 3-4, 11, 36-37, 44.

16. *Rubber India.* (Sept 1982). **Vol XXXIV** no 9. All India Rubber Industries Association, India; 7-11, 29-31.

17. Babbit RO. (1978). The Vanderbilt Rubber Hand Book. RT Vanderbilt Company, Inc., New York; 13.

18. Koenig JL. (1983). Advances in Polymer Science 54 (Fourier Transform Infrared Spectroscopy of Polymers). Springer-Verlag, Heidelberg, USA; 89-90, 131-132.

19. Sultanbawa MUS, Munasinghe VRN. (1987). Organic Chemistry Practicals PSU 2114 - level 4. The Open University of Sri Lanka; 86-87, 94-95.