CHAPTER 4

CONCLUSION AND SUGGESTIONS FOR FURTHER RESEARCH

4.1 Conclusion

Three fusion cook alkyds, namely Alk-45, Alk-47 and Alk-65 were successfully formulated and synthesized. They were synthesized from similar materials but at different proportions of oil content. These alkyds have similar molecular structures as shown by FTIR and NMR spectroscopy. These fusion cook alkyds were emulsified by emulsion inversion point method (EIP) and blend with NR latex to form water based pressure sensitive adhesives (PSAs). From rheological test, the most stable alkyd emulsion for Alk-45 and Alk-47 were produced by surfactant mixture S-8020, whereas for Alk-65 was produced by surfactant mixture S-5050. The stable alkyds emulsion formed were blended with NR latex and coated onto plastic backing to produce the water - based pressure sensitive adhesives tapes. The properties of PSAs tapes produced were investigated.All the alkyds emulsion by themselves did not have peel nor shear strength. These alkyd emulsions were blended with NR latex at 4 different ratios in which each ratio displayed different adhesives properties. In general, NR/alkyd emulsion blends showed good performance of peel strength when alkyds emulsion was the dominant component but low shear strength at both blending ratios. Among the three alkyds, Alk-47 improved the peel strength and shear strength of PSAs tape which is better than Alk-45 and Alk-65. It was noticed that, the values of peel strength results at higher blending ratio fall in the range of commercial tape value. Besides that, the result showed the ability of the alkyds resin as the tackifier resins for NR in order to produce required balance of peel adhesion and resistance to shear of PSA tape.

4.2 Presentations at conferences / Seminars/Publications

Parts of the findings have been presented at the following conferences/Seminars

(i) Mustafa, M. S. F., Gan, S. N., and Yahya. R., Synthesis and Characterization of Palm oil-based Polyester Resin, Malaysia Polymer International Conference**(MPIC)**, 21-22October 2009, Palm Garden Hotel IOI Resort, Putrajaya.

(ii) Mustafa, M. S. F., Gan, S. N., and Yahya. R., Water-based Pressure Sensitive Adhesives (PSAs), from Natural Rubber Latex, 3rd International Conference for Young Chemist**(ICYC)**, 23-25 Jun 2010, Copthorne Orchid Hotel, Penang.

(iii) Mustafa, M. S. F., Gan, S. N., and Yahya. R., Development of Environmental Friendly Pressure Sensitive Adhesives (PSAs) from NR Latex, 16th Malaysia Chemical Congress**(MCC)**, 12-14 October 2010, Putra World Trade Centre, Kuala Lumpur.

(iv) Mustafa, M. S. F., Yahya, R., Gan, S.N "Synthesis and Characterization of Novel Alkyds Derived from Palm Oil Based Polyester Resin," *Asian Journal of Chemistry*, **(Volume 25, 2013)**.

(v) Mustafa, M. S. F., and Yahya. R., "Environmental friendly Water-based Pressure Sensitive Adhesives (PSAs) Formulation" *Asian Journal of Chemistry*, **(Submitted)**.

4.3 Suggestions for future of work

This research has presented the groundwork for developing environmental friendly water-based PSAs formulation from palm oleic alkyds resin and natural rubber latex. There are much work remain to be performed that can be used in improving this research.

(i) In future, it would be of interest to study the viscoelastic behavior of the NR/ alkyd emulsions blend using Dynamic Mechanical Analyzer (DMA).

(ii) In order to improve the shear strength of PSAs tape produced, it would be of interest to formulate alkyds with the other oil lengths between short oil length to medium oil length (30-47) in order to find suitable alkyds that could improve adhesive properties, both the peel and shear strengths.

(iii) Another aspect of interest to investigate is the effect of heating rate and the surfactant effect towards adhesive properties in details.