CHAPTER V

CONCLUSION

This study was aimed to modify and purify rosin, to increase the quality and value added of rosin. The process of this observation was separated into two sections. The first section was related to the dehydrogenation reaction (disproportionation) to produce dehydrogenated rosin and the second process was related to hydrogenation reaction to produce saturated resin acids.

The dehydrogenation (disproportionation) reaction of rosin was operated in a temperature range of 240–280°C and concentration of Pd/C catalyst 0.3% by weight of rosin for 4 hours under nitrogen atmosphere. To purify the dehydrogenated rosin, it was distilled under reduced pressure 3 mmHg in atmosphere of nitrogen and about 87% of dehydrogenated rosin was obtained. The purified rosin was recrystallized from a suitable solvent (acetone) to obtained purified rosin (dehydrogenated rosin) having a melting point of 160°C.

The dehydrogenated rosin is sufficiently pure for use in the high quality products such as fixatives in the perfume industry. Dehydrogenated rosin (not crystallized) has been used as a raw materials to produce metal soaps which are used as emulsifiers in production of many polymer emulsions such as SBR, paper sizing agents, and for abrasive resistance in polymers [5]. Dehydrogenated rosin is also used as a starting material for production of resin esters. The preparation involves the reaction of disproportionated rosin with poly alcohols such as ethylene glycol, tetraethylene glycol, pentaerythriol, etc.

Most of the ester products have been used as tackifiers for hot–melt adhesives, pressure–sensitive adhesives, resin for inks, raw material for industrial paints, resins for paints, modifiers used in rubbers and plastics, flux for solders, and the like.

The hydrogenation reaction was observed under varied parameters; type of catalysts, reaction temperatures, reaction times, hydrogen pressures, and catalyst concentrations, using ethanol as solvent. The observed optimum conditions for hydrogenation are 200°C, 12 hours, 700 psi hydrogen and 10% catalyst by weight of rosin in the presence of Raney Nickel catalyst. Hydrogenated rosin was purified by distillation under pressure of 3 mmHg in an atmosphere of nitrogen to give purified hydrogenated rosin (86.23%).

The hydrogenated rosin from this experiment is adequately pure for use in high quality products or as a raw material for metal soaps, and esters. The hydrogenated rosin has high resistant to air oxidation, so it is often used as a softener, tackifier, and plasticizer in natural as well as synthetic rubber, pressure–sensitive adhesives, sizing agent for high grade papers, and the like.