# CHAPTER V

# CONCLUSION AND SUGGESTIONS

## 5.1 Conclusion

From this study, microcrystalline wax was prepared from the bright stock by sweating process and followed by oxidation procedure. The products were brown color material and obtained in 82.50 % yield.

The first step of sweating process at 73 °C for 36 hr could remove oil and low melting point substances. After sweating the wax from this step had its drop melting point at 82.2 °C (determined by ASTM D 127). This step reduced the oil content in wax from 4.57 % by weight to 3.07 % by weight at the end of this process.

The last step was to subject the sweated wax to oxidation process in order to increase the hardness and tackiness. The oxidation reaction was operated in a batch reactor with a catalyst containing cobalt stearate. When the reaction was operated at optimum condition (catalyst concentration of 2% by weight of wax, reaction temperature at 110 °C, and reaction time at 24 hr.) the hardness and tackiness of the oxidized wax was more than those of the sweated wax. It was found that the value of penetration and kinematic viscosity were increased. The results from this study showed that the properties of microcrystalline wax could be improved by the oxidation process.

Finally, the physical properties of the microcrystalline wax were carried out according to ASTM method of general waxes, which are shown in Table 5.1.

**Table 5.1** The physical properties of the microcrystalline wax

| Testing Method | Standard | Value |
|---|---|---|
| Drop melting point | ASTM D127 | 80 °C |
| Congealing point | ASTM D938 | 73.9 °C |
| Oil content | ASTM D721 | 3.07 %wt |
| Kinematic viscosity@100°C | ASTM D445 | 46.28 cSt |
| Penetration @25°C | ASTM D1321 | 43.5 mm/5s |
| Flash point | ASTM D92 | 244 °C |
| Estimate molecular weight | ASTM D2502 | 1079 |

The properties of these waxes were found to be within the specification of the general wax. Thus, they could be used in similar manner to that of the commercial microcrystalline wax.

## 5.2 Suggestion for further work

The characteristic of microcrystalline wax using Gas Chromatography or other techniques should be further studied.