

CHAPTER V

CONCLUSION AND SUGGESTIONS

5.1 Conclusion

In the hydroxypropylation of tapioca starch, propylene oxide and sodium hydroxide were found to have the most significant effect on high degree of substitution. This study also illustrated that the concentration of sodium sulfate was important for this reaction. However, the small increase in DS was observed when sodium sulfate concentration was higher. This was due to its role on inhibiting gelatinization during the reaction, not directly involved in the formation of the hydroxypropylated starch. Since all these reaction variables were related to the reaction, the three-level experimental factorial design was used to determine the optimum condition of this reaction. The highest DS and RE, 0.2797 and 71.5%, respectively, were obtained when the reaction was operated using water as a reaction medium, sodium hydroxide 2%, propylene oxide 14%, sodium sulfate at 40°C for 24 hours. The pasting property depended on the DS of hydroxypropyl group. With higher DS, its gelatinization temperature was lower and the viscosity was higher. Therefore, the hydroxypropylation of improve starch with the appropriate level of substitution can be performed to suit the required application.

5.2 Suggestions for Further Work

1. Varying the ratio of starch and water for improving the reaction efficiency of hydroxypropylation of tapioca starch.
2. Other reactions can modify the tapioca starch: acetylation or crosslinking after hydroxypropylation. It will improve the properties of tapioca starch for a wide range application.



ศูนย์วิจัยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย