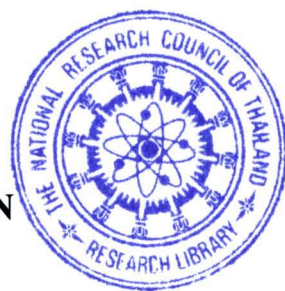


CHAPTER V

CONCLUSIONS AND SUGGESTION



5.1 Conclusions

5.1.1 The content of main components in durian and pineapple peel investigated by DTG/TGA technique

Both durian and pineapple peels mainly compose of hemicelluloses, cellulose and lignin. They were showed in different contents. Although the durian peel give percentage of cellulose of 33.03 which higher than the cellulose in pineapple peel of 21.16 but other components were less than pineapple peel such as 1.25, 9.50 of hemicelluloses and 35.16, 42.11 of lignin, respectively.

5.1.2 The content of main components in durian and pineapple peel investigated by TAPPI T203 test method

Successfully, TAPPI T203 test method can be used for sample preparation. This method gave several of three samples which could determine and remove the main components and identified by FTIR technique in each steps of removable processes. The durian and pineapple peel give the percentage of main components of 1.21, 9.43 of hemicelluloses, 32.88, 20.44 of cellulose and 35.16, 41.21 of lignin, respectively. The content of main components obtained by this method was responded to DTG/TGA data.

5.1.3 The dilute acid hydrolysis for total reducing sugars

The diluted acid hydrolysis is achieved by two different methods of an electrical autoclave and a hot plate. However, the total reducing sugar is obtained when the electrical autoclave was used. Since, the method could control both complete heat and the pressure. Therefore, an electrical autoclave was chosen for dilute acid hydrolysis in this research. The hydrolyzed solution of sample 3 and sample 2 of durian and pineapple peels which hydrolyzed in an electrical autoclave gave high the content of the total reducing sugars. The sample 3 of durian and pineapple peels could give highest nearly content of total reducing sugars. Normally,

the structure of the cellulose was linear chain polymers then could be hydrolyzed easier than the others. The hydrolyzed solution of sample 2 also had glucose and other reducing sugars from the hydrolyzed hemicelluloses. In fact, the structure of hemicelluloses was long and rowdy branches which could be a blocker in diluted sulfuric acid hydrolysis. The hydrolyzed solution of sample 1 gave total reducing sugars that was quite low because the effect on high amount and complicated structure of lignin, including long and rowdy branches of hemicelluloses. The sample 1 of pineapple peel could give the total reducing sugar less than durian peel because the pineapple peel had the highest content of the lignin.

5.1.4 The content of cellulosic ethanol

The cellulosic ethanol from durian and pineapple peels was simply and enhance produced with the preparation of cellulose in the removable processes of TAPPI T203 test method. The batch fermentation by *S. cerevisiae* gave the highest bioethanol yield of 0.663 g/g and 0.653 g/g in case of raw durian and raw pineapple peels. The ability of *S. cerevisiae* for conversion of glucose to cellulosic ethanol was better than other reducing sugars. The structure of main components in raw durian and pineapple peels affected on the contents of the total reducing sugars and cellulosic ethanol.

5.2 Suggestion

5.2.1 In removable processes of TAPPI T203 test method should intensively be filtrated because it will be affected to error weight of each sample.

5.2.2 For dilute acid hydrolysis on a hot plate should be correctly adjusted including control temperature and time.

5.2.3 The microorganism growth and batch fermentation should control the conditions for highest products.

5.2.4 The next research work should purify cellulosic ethanol with advance method such as membrane system and pervaporization.