CHAPTER V
CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The present work demonstrated the new adsorbent for CO_2 adsorption by amine functionalization of biopolymer with piperazine-2-carboxylic acid. The original biopolymer was purified to get the high degree of deacetylation of 96.43 %. The purified biopolymer used as the active amine sites to react with piperazine-2-carboxylic acid. The amine functionalization was carried out in a solution of glacial acetic acid, isopropyl alcohol, and water. The optimal mole ratio of purified biopolymer to piperazine-2-carboxylic acid was 1:2 and the degree of piperazine substitution in the modified biopolymer was 72.71%. The modified biopolymer was thermally stable at temperature up to 190 °C.

5.2 Recommendations

5.2.1 In the characterization of the modified biopolymer, there should be another method to confirm the degree of substitution (%DS) of the modified biopolymer such as CHN analyzer.

5.2.2 In order to increase the degree of substitution, effects of reaction temperature and time should be.

5.2.3 Surface area and pore volume of adsorbent are one of important parameters in CO_2 adsorption, since increase of surface area and pore volume of adsorbent will increase the CO_2 adsorption capacity. The surface area and pore volume of the biopolymer adsorbent modified with piperazine should be evaluated.

5.2.4 For further study, experiments of CO_2 adsorption efficiency, dynamic CO_2adsorption capacity and regeneration have to be studied to determine the probability of CO_2 adsorption.