CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The hollow silica and activated carbon were selected to study for their effects on the methane hydrate formation and dissociation. This study found that the methane hydrate can form in both porous media. Even though the temperature profiles and rate of methane hydrate formation were different but the final methane hydrate formation were higher in both porous media systems than the system with only water. The hydrate formation time in the system of $AC/H_2O/CH_4$ took longer time than the system of $HS/H_2O/CH_4$. Hence, the characteristics of porous media affected the behavior and rate of methane hydrate formation. The effect of pressure driving force for methane hydrate formation was observed in the system conducted at 8 MPa and 6 MPa in both porous media systems. The effect of pressure driving force on the rate of methane hydrate formation and methane gas uptake was not significant in the system of $HS/H_2O/CH_4$, whereas it was significant in the system of $AC/H_2O/CH_4$. For the methane hydrate dissociation, the different of initial pressure did not significantly affect the rate and methane recovery in the systems with the presence of hollow silica and activated carbon. The rate of methane hydrate dissociation in the system with hollow silica was faster than that the activated carbon system. However, the final methane recovery in the system with activated carbon was significantly lower than the system with hollow silica system because some methane gas remained in the water and pores of activated carbon after the methane hydrate dissociation was completed. Therefore, it can imply that the mechanisms of methane hydrate formation in both porous medium are different.

5.2 Recommendations

Based on what has been discovered in this study, the following recommendations are suggested:

1. Use silica sand with the same size as hollow silica (30-70 μm) to study about the methane hydrate formation and dissociation.
2. Chemical treatment on the activated carbon will be an effective method to increase the amount of gas consumption in the methane hydrate formation.