CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Methyl bromide synthesis via oxidative bromination of methane (OBM) reaction has been studied in this work. It was found that the selective production of methyl bromide was achieved at relatively low reaction temperature but methane conversion is still low. It was also demonstrated that the OBM reaction can be favourable on Rh/SiO_2 catalyst in term of enhancing methane conversion. Moreover, the catalyst ability has been affected by different Rh loading and calcination conditions. The highest yield of methyl bromide can be achieved on 0.5 wt% Rh/SiO_2 catalyst calcined at 450 °C for 6 h. The benefit of this reaction is not merely less energy consumption, but also more environmental friendly. Methyl bromide, main product from this reaction, is a versatile intermediate that can be used to produce many higher hydrocarbons and/or other chemicals.

5.2 Recommendations

Due to the unpractical results, further study of this reaction will be studied. For example, in this work, the catalyst preparation was performed by using the incipient wetness impregnation method, which has the limitation of metal salt solubility and pore volume of support. Sol-gel techniques will be recommended for the future work because some previous researchers successfully developed Rh/SiO_2 catalyst prepared by sol-gel method for OBM reaction. Moreover, new catalyst selection and reaction condition optimization should be more investigated in order to reach the maximum yield of methyl bromide.

The characterization for proving the exact active species was also not fully clear. Thus, XPS will be suggested as a suitable technique to specify the metal form.