CHAPTER VIII
CONCLUSIONS AND RECOMMEDATIONS FOR FUTURE WORK

Atrane precursors, alumatrane and silatrane, prepared from the Oxide One Pot Synthesis (OOPS) process, were successfully used for synthesizing mesoporous $AlPO_4$-5 and SAPO-5 zeotype with AFI topology via microwave technique using triethylamine as a structure-directing agent. Triisopropanolamine and triethanolamine molecules generated from the hydrolysis reaction of alumatrane and silatrane, respectively, apparently were co-structure-directing agents to develop the pore system. When changing the mixture composition of SAPO synthesis in the absence of TEA, flower-like SAPO was formed. Pt impregnated mesoporous $AlPO_4$-5, SAPO-5, and flower-like SAPO were investigated the activity testing on the PROX of CO. A higher Pt content impregnated showed a better catalytic activity for all supports. An enhancement of the catalytic performance with the complete CO removal was obtained on Pt impregnated mesoporous $AlPO_4$-5 than those prepared via the sol-gel process and using commercial aluminum precursor. A 100% CO conversion was also accomplished over Pt impregnated flower-like SAPO to completely deplete CO contaminated in the H_2-rich feed gas as a fuel in proton exchange membrane fuel cells (PEMFC).

Recommendations for future work

Possible direction for future work is expected to be in the area of catalysis application, as follows:

1. The preparation of others types of interesting metals, such as Au, Fe, Mg, and Ni on mesoporous $AlPO_4$-5 and SAPO-5 should be studied to make them more useful in various catalytic reactions.

2. To study the efficiency of the catalyst, other types of catalytic activity need to be further studied for mesoporous $AlPO_4$-5 and SAPO-5, such as, isomerisation and alkylation of hydrocarbons.