CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

Pillared hydrotalcite-type clays were studied as SCR catalysts using NH_3 in the temperature range of 150-450°C. They showed over 99% N_2/N_2O selectivity at all testing temperatures. The activity significantly increased with temperature beyond 300°C. All pillared-clays have different thermal transition behaviors in the different stages of calcination temperatures, which affected the SCR activity. Pillared-clay catalysts calcined at 500°C gave higher activity than the others, and PW_{12}-clay catalyst had the highest activity. 5% Fe loading by impregnation method significantly increased activity of pillared-clay catalysts while N_2/N_2O selectivity was maintained. Fe-loaded catalysts also showed obviously higher N_2/N_2O selectivity over the commercial catalyst; 4.4% V_2O_5 –8.2% WO_3/TiO_2.

Normally, The activity of SCR catalysts was declined at temperatures above 400°C, due to the activity for NH_3 oxidation at high temperature (Yang *et al.*, 1992). The temperature dependence of pillared-clays did not follow this trend, thus, pillared-clay catalysts did not exhibit activity for NH_3 oxidation in all testing temperatures, which is a desirable property for SCR catalyst.

Environmental friendly is one of major advantage of these pillared-clays for being used as catalyst in SCR process. For the future work, these pillared-clays might be used as catalyst, catalyst support, or catalyst metrix in order to improve the activity and selectivity. Moreover, for experimental parameters, it is recommended that the effect of H_2O vapor and SO_2 be determined, because most NO effluent streams normally contain these two components.