CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

Actually, the catalytic activity of Au/Al_2O_3 and $Au/Ba/Al_2O_3$ catalysts prepared by impregnation and sol-gel methods should be investigated on NO_x storage-reduction approach which feed gases were fed alternately under oxidizing and reducing conditions as a cycle. However this approach could not be accomplished due to some instrument limitations thus, selective catalytic reduction approach which the catalyst was exposed to the all of reactant gases for long period was performed.

For the reaction studies, 0.7% Au impregnated on sol-gel Al_2O_3 and 0.7% Au impregnated on $5\%Ba/Al_2O_3$ catalysts showed the highest activity at 475 and 500 ^0C, respectively. The percentage of gold loading on Al_2O_3 and Ba/Al_2O_3 catalysts had no significant effect on the activity while the percentage of barium loading on $Au/Ba/Al_2O_3$ catalysts showed a significant effect. The activity decreased with increasing barium content because $Ba(NO_3)_2$ was decomposed and released high amount of NO_x and the reaction was not run in cycle as storage-reduction mode. The sequence of impregnation Au and Ba were also investigated and found that there had no effect on the catalytic activity. The presence of 3 vol% water vapor content in feed stream had no power on NO_x conversion of both Au/Al_2O_3 and $Au/Ba/Al_2O_3$ catalysts. For gold activation using pretreatment gases, further studies are required in order to explain the activity of catalysts.

It is needed to prove that NO_x storage-reduction approach is a promising technique for NO_x removal. Thus, for future work, pulse system as NO_x storage-reduction should be employed by setting some suitable instruments. For experimental parameters, it is recommended that water vapor content in feed stream be varied from 3 up to 10 vol% and the performance of resistance to SO_2 be carried out because most NO_x exhaust streams usually contain these two components.