CHAPTER V
CONCLUSIONS

The selective oxidation of propylene was investigated. The catalytic activity was strongly effected by catalyst preparation methods. The Ag/Al_2O_3 catalysts prepared by sol-gel method had very high surface areas with very good silver dispersion on the Al_2O_3 support. The deposition-precipitation supported catalysts showed much lower surface area depending on initial surface area of TiO_2 support.

The silver supported on alumina catalyst had low selectivity to partial oxidation of propylene. It produced high conversion of CO_2 and H_2O, and only total oxidation occurred at high reaction temperature. There was no partial oxidation occurred, only total oxidation and H_2 combustion occurred at reaction temperature higher than 200°C.

Gold catalyst prepared by deposition-precipitation method was selective for partial oxidation of propylene. At below 100°C reaction temperature, gold catalyst was selective only to the partial oxidation of propylene but at reaction temperature higher than 200°C the total oxidation of propylene was dominant. The Au/TiO_2 supported catalyst showed the highest catalytic activity for propylene epoxidation at 80°C reaction temperature.

The catalytic activity was also effected by the amount of hydrogen in the feed stream. The optimum hydrogen concentration was 10 % hydrogen with 10 % propylene and 10 % oxygen. The calcination temperatures, in the range of 500-600°C, did not affect the catalytic activity of propylene epoxidation.

For future work, it was recommended that the catalytic activity of Au/TiO_2 at different metal loadings should be carried out at different space velocities, calcination temperatures and feeding stream compositions. And

also the partial oxidation of propylene should be carried out with different types and surface areas of TiO_2 supports.