CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The conclusions emerged from this research are shown as follows:

1. Tungsten and potassium loading barely affect the fluctuation of 25wt%V_2O_5/TiO_2 surface area.

2. The order of catalytic performance of catalysts are as follows: 5wt%W-25wt%V_2O_5/TiO_2 > 25wt%V_2O_5/TiO_2 > 3wt%K-25wt%V_2O_5/TiO_2.

4. From pyridine adsorption experiment, tungsten loading can increase significantly the number of both Lewis and Brönsted acid site. While potassium loading decreases significantly the Lewis and Brönsted acid site. On pure TiO_2 support, Lewis acid site only is observed.

5. SO_2 addition slightly promotes the selective catalytic reduction of NO with NH_3 on both 25wt%V_2O_5/TiO_2 and 3wt%K-25wt%V_2O_5/TiO_2 at the reaction temperature below 300 °C. At higher reaction temperature, SO_2 introduced enhances ammonia oxidation. As for 5wt%W-25wt%V_2O_5/TiO_2, SO_2 suppresses the SCR reaction at low temperature.

6. Pyridine adsorption experiment and catalytic activity test show that Lewis acid sites play more important role for the SCR of NO with NH_3 than Brönsted acid site

6.2 Recommendations for future studies

From the above conclusions, the following recommendations for future studies can be proposed as below.

1. Investigate the change of oxidation state of V_2O_5-based catalysts during the reaction.

2. Study the relationship between the change of oxidation state and acidity of the catalysts.