CHAPTER IV

CONCLUSION AND SUGGESTIONS

4.1 Conclusion

This thesis investigated the catalytic activity of coprecipitated reducible metal supported silver catalysts for low temperature CO oxidation. Base metal oxide(s) (Mn, Co) promoted the thermal stability of catalyst and Ag component enhanced the catalytic activity of reducible metal oxide supported silver catalysts. In addition, we found that the catalytic activity depended extensively on temperature and environmental conditions employed, as they affected changes in phase and structure of catalysts.

We also found that the Ag-Mn catalyst dried at 100°C was the most active catalyst as higher active and more stable; however, ternary oxide, Ag-Mn-Co catalyst was the most tolerant to temperature, moisture, and reduction conditions. Ternary oxide was the most thermally stable (Haruta and Sano, 1983), because three combined components promoted their stabilities.

Not only losses of moisture and oxygen from catalysts affected deactivation scenarios, but also there were the other significant causes to deactivation. They were possible an agglomeration of silver oxide and a formation of carbonate. Silver oxide was reduced and CO_2 adsorbed strongly on active manganese oxide upon reaction. Furthermore, this phenomenon was irreversible process, they cannot be fully recovered by any regeneration methods (such as, humidification or oxidation treatments).

4.2 Suggestions

The following suggestions are recommended for future studies.

1. Moisture enhanced the catalytic activity of Ag-Mn catalyst; therefore, the deactivation studies of Ag-Mn catalyst with humidified reactant gases should be examined.

2. Since Ag-Mn-Co catalyst was the most tolerant to various conditions (temperature, moisture, and reduction conditions), the atomic ratios of Ag/Mn/Co should be adjusted to obtain the most tolerant and highest active catalyst.