

CHAPTER V

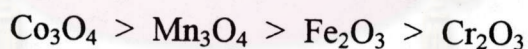
CONCLUSIONS AND FUTURE WORKS

Conclusions

1. In the reaction of CO with N₂O, the catalytic activity of different metal oxide catalysts in the temperature range 180-350°C are :



In the reaction of CO with O₂, the catalytic activity of different metal oxide catalysts in the temperature range 130-330°C are :



These order correspond to the surface area measuring by BET method. %CO conversion of the two reactions are high (could approach to 100%, except when Cr₂O₃ was used as a catalyst) in the range of temperature that is lower 400°C (this temperature range is appropriate for using in the catalytic converter). Co₃O₄ is the highest activity but its thermal stability is lower 800°C. Therefore, Fe₂O₃ should be the appropriate catalyst in this experiment because it has the high activity and it is very stable within the temperature range of 40°C to 900°C. Although, Fe₂O₃ catalyst is the most expensive in the four catalysts.

2. The catalytic activity in the reaction of CO with O₂ is higher than the catalytic activity in the reaction of CO with N₂O. This indicates that oxygen is the better oxidant than nitrous oxide. Therefore, oxygen should be used as an oxidant in the carbon monoxide oxidation reaction because, in addition to providing high activity to this reaction, oxygen is also cheaper and impoison.

Future Works

Oxidation reaction of carbon monoxide with oxygen and nitrous oxide are studied using transition metal oxides which for this work are Co₃O₄, Fe₂O₃, Mn₃O₄, and Cr₂O₃ as catalysts. They also can be mixed together in various ratios in order that they will provide high activity to the reaction and their cost will be cheaper. Besides, metals and metal oxides are used quite often in industrial partial oxidation reaction, so metals and metal oxides can be used in this reaction, too.

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