สำนักงานวิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

It can be concluded that the addition of Mg by both sequential incipient wetness impregnation and co-impregnation methods into the catalyst caused the light-off temperatures shifted to higher temperatures. However, the addition of Mg by sequential incipient wetness impregnation method could diminish the Boudouard reaction and prevent the agglomeration of Ni particles on MPO at high temperatures resulting in the stability of the catalyst. Among the catalysts tested, the 15Ni5Mg/CZO (S) catalyst exhibited the highest catalytic stability for MPO with a prolong time on stream of 18 hours at 750 °C. An appropriate H_2/CO ratio of 2 was obtained for 15Ni5Mg/CZO (S) catalyst. The catalysts prepared by sequential incipient wetness impregnation method possessed slightly higher catalytic activity for MPO than those prepared by co-impregnation method. Moreover, the carbon deposition on the 15Ni5Mg/CZO (S) was significantly less than that of the 15Ni5Mg/CZO (C) indicating the significant influence of mixed oxide catalyst preparation method.

5.2 Recommendations

Methane partial oxidation is an attractive process for H_2 production. The challenge of this process is how to maximize H_2 production, and minimize the carbon deposition on the catalysts. For this present work, an objective to suppress the carbon deposition by adding MgO over 15Ni/CZO catalyst is satisfied. However, the catalytic activity by incorporating MgO over 15Ni/CZO catalyst might be improved. Therefore, development of new preparing method and/or using small amounts of MgO (< 5 wt%) into 15Ni/CZO catalysts should be studied.