CHAPTER V
CONCLUSIONS

The catalyst preparation technique and alumina support greatly affect Ni crystallite form and its crystallite size and this in turn affect catalytic activity and stability. However, the addition of Ni either by sol-gel technique or by impregnation technique had little effect on the surface area or the structure of catalysts.

The product distribution of methane reforming reaction is controlled by the reverse water gas shift reaction, which causes CO_2 conversion to be higher than CH_4 conversion and CO selectivity higher than H_2 selectivity.

There are at least two types of carbon: amorphous carbon and graphitic carbon formed on each catalyst. The amorphous carbon is oxidized at the temperature around 675 °C whereas the graphitic carbon is oxidized at the higher temperature around 690 °C.

The type and amount of carbon deposited are different depending on the catalyst. The Ni/sol-gel Al_2O_3 catalyst had the highest Ni dispersion, the highest activation energy and longer stability compared to sol-gel Ni/Al_2O_3 and Ni/commercial Al_2O_3 catalyst.