

## **CHAPTER V**

### **CONCLUSIONS AND RECOMMENDATIONS**

The ordered mesoporous ceria were successfully synthesized using mesoporous MCM-48 silica, as hard template via nanocasting method. The optimum conditions achieved were to use 50% weight of ceria, 30 min stirring time, 100 °C evaporated temperature, and 1 filling cycle. The XRD and TEM results confirmed that the ordered mesoporous ceria retained ordering from MCM-48 while the XRF results confirmed the removal silica template from the ordered mesoporous ceria. Comparison of the ordered mesoporous ceria with commercial ceria powder; the ordered mesoporous ceria exhibited much larger surface area and also showed a larger area under the TPR peak, referred to the reduction of the surface-capping oxygen.

The future work should be focused on the applications of the ordered mesoporous ceria, based on this work, such as energy conversion and storage, catalysis, adsorption, and separation.