

Chapter VI

Conclusions and Recommendations

6.1 Conclusions

The conclusions of the present research are the following:

1. Physical properties and thermal stability of zinc gallate and zinc aluminate can be controlled by the reaction of the crystallite formation besides reaction conditions and strengthen of the alkyl group of the metal alkoxides.
2. The reaction of crystallite formation occurred rapidly, the crystallization of products occurred rapidly too, therefore as-synthesized products were well-crystallized spinel, high surface area and high thermal stability.
3. The thermal stability of zinc gallate and zinc aluminate products did not depend on type of organic solvents used in synthesis. But it strongly depended on the crystallite sizes of them.
4. The type of second metal influence on the thermal stability and the rate of thermal stability decreasing of the metal oxide differently.

6.2 Recommendations for the future studies

From the previous conclusions, the following recommendations for the future studies are proposed.

1. Study about effect of reaction conditions and structure of starting materials (zinc source, gallium source, and aluminium source) on the physical properties

and thermal stability of the products.

2. Study the role of second metal on the thermal stability of metal oxide.
3. Study the relation of the thermal stability of single metal oxide and the crystallite size, and compare with thermal stability of double metal oxide.
4. It will be interesting to study the use of the zinc gallate and zinc aluminate obtained by this method as catalyst or catalyst support for the oxidative dehydrogenation of light alkane or double bond isomerization process of alkanes or dehydration of saturated alcohols to olefins, or as advance ceramic material or as semiconductor.