بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

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"SYNTHESIS OF MESOPOROUS MOLECULAR SIEVES AND THEIR USE IN PARAFFINS HYDROCONVERSIONS"

A Thesis Submitted

For the M. Sc. Degree (Chemistry)
(In Partial fulfillment)

To

The Department of Chemistry
Faculty of Science
Cairo University

By

Samar Said Muhammed Abdelaal

2009

بسم الله الرحمن الرحيم

"يرفع الله الذين ءامنوا منكم والذين أوتوا العلم

درجات والله بما تعملون خبير"

صدق الله العظيم

DEDICATED

TO

MY Mother

ACKNOWLEDGMENT

*All gratitude is due to **ALLAH** who guided and aided me to bring forth to light this thesis.*

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APPROVAL SHEET FOR SUBMISSION

Title of the M. Sc. Thesis:

"Synthesis of mesoporous molecular sieves and their use in paraffins hydroconversions"

Name of the candidate: Samar Said Muhammed Abdelaal

This thesis has been approved for submission by the supervisors:-

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ABSTRACT

Name: Samar Said Muhammed Abdelaal

Title of thesis: "Synthesis of mesoporous molecular sieves and their use in paraffins hydroconversions".

Degree: M.sc., Faculty of Science, Cairo University, 2009

Nowadays, isomerization of n-paraffins plays an important role in the petroleum industry. Isomerization reaction generally takes place over bifunctional metal /acid catalysts.

Pure siliceous SBA-15 and AlSBA-15 of different n_{Si}/n_{Al} ratios (5, 7 and 14) were synthesized by well- known procedures and used as supports for preparation of Ni and Pt catalysts with different percentage. The catalysts were prepared by impregnation technique.

Supports and the prepared catalysts were characterized by X-ray diffraction (XRD), Nitrogen physisorption, Differential Scanning Calorimetry (DSC) and Thermal Gravimetric Analysis (TGA).The results showed that by Ni or Pt loading, both SBA-15 and AlSBA-15 supports preserve their hexagonal porous arrangement. All the samples are thermally stable up to 600 °C. BET surface area, pore volume and pore diameter were decreased as the Ni or Pt loading increased, also the intensities of d_{100} diffraction peaks were affected.

The catalytic activity and selectivity of the prepared catalysts were studied through the dehydrogenation of cyclohexane and through the hydroconversion (hydroisomerization and hydrocracking) of n-hexane in pulse flow system.

0.6 wt%Pt/SBA-15 and 0.3 wt%Pt/AlSBA-15(5) catalysts were active and selective toward cyclohexane dehydrogenation into benzene. Also the latter one showed high activity for n-hexane isomerization. Whereas Ni/SBA-15 and Ni/AlSBA-15 catalysts showed high activity for cyclohexane and n-hexane hydrocracking.

Keywords: *SBA-15; AlSBA-15; Pt catalysts; Ni catalysts; hydroconversion; Dehydrogenation; n-hexane; cyclohexane.*

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