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นางสาว อินทิรา สัจวารภรณ์

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

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**IRON-CONTAINING MFI CATALYSTS FOR CONVERSION OF METHANOL TO
OLEFINS**



Miss Intira Sangvaraporn

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

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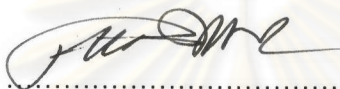
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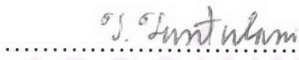

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(Aticha Chaisuwan, Ph.D.)


..... Member
(Associate Professor Vudhichai Parasuk, Ph.D.)


..... Member
(Assistant Professor Thawatchai Tuntulani, Ph.D.)

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The iron-containing-MFI catalysts with various Si/Fe ratios (10 to 90) were synthesized by direct synthesis under hydrothermal condition. The effect of pH (8.0 to 11.0) of the starting gel mixture on the crystallinity of the selected Fe-MFI (Si/Fe ratio in gel of 90), and sites of framework or non-framework sites incorporated irons, were investigated using X-ray diffractometer, scanning electron microscope, particle size analyzer, electron spin resonance and atomic absorption. It was found that the pH of gel affects the particle size, morphology, and the amount of iron in each site. XRD data show that all products have MFI structure and the crystallinity of Fe-MFI decreases with the increase in iron content. Hydrogen Fe-MFI was prepared by ion exchange with ammonium chloride solution at boiling temperature with stirring overnight followed by calcinations, and the treatment was repeated once more. The present sodium ions, temperature (300-500°C), Si/Fe ratio, and morphology have strong influence on the %conversion of methanol, yield and selectivity of products. Sodium ions affect the activity of the catalyst because they blocked the acid sites. Nearly complete conversions of methanol and highest selectivity to propylene are obtained at 450°C over Fe-MFI (Si/Fe ratio = 87), where coke deposition on the single-run catalysts was a low. Decreasing of iron content leads to higher selectivity to light olefins and less coke deposited on the catalyst. The highest yield of gas products was obtained using spherically-shape compared to plus-like Fe-MFI.

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

Department.....Chemistry.....Student's signature.....*Intira Sangvaraporn*
Field of study.....Chemistry.....Advisor's signature.....*A. Chaisuwan*
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ศูนย์วิทยทรัพยากร
 จุฬาลงกรณ์มหาวิทยาลัย

LIST OF ABBREVIATIONS

AAS	=	Atomic Absorption Spectrometer
BET	=	Brunauer, Emmett, and Teller
ESR	=	Electron Spin Resonance
Fe-MFI	=	Iron-containing Mobil Five
GC	=	Gas Chromatograph
GC-MS	=	Gas Chromatograph- Mass Spectrometer
GHSV	=	Gas-Hourly Space Velocity
MTO	=	Methanol to Olefins
SEM	=	Scanning Electron Microscope
TOS	=	Time on Stream
TPABr	=	Tetrapropyl ammonium bromide
XRD	=	X-ray diffraction or diffractometer
ZSM-5	=	Zeolite Socony Mobil Five