



## Improved Catalyst for Light Olefins Production

### The Invention

This technology relates to improving production of light olefins from cracking of butenes produced by refineries equipped with fluid catalytic cracking (FCC) units or petrochemical plants using silicalite-1 catalyst.

### Market Need

Middle East accounts for 15% of butene global consumption. In addition, oil refineries supply about 30% of the global propylene market, FCC units have historically been optimized for the production of gasoline, so that propylene typically accounts for a paltry 3-6% of their output, but still there is increasing demand for standalone production units.

Ethylene, propylene and methanol are expanding at a rapid rate driven by shale oil technology. Market capacity of propylene is expected to reach 140 million tones by 2020<sup>1</sup>.

In addition, the fuel market accounted for about 56% of the total world consumption of butylenes and chemical usage for about 44% of total consumption.

<sup>1</sup>Grand view research 2015

### Applications

Possible applications for the catalyst are where olefins are produced via cracking:

- The catalyst can be used in FCC unit.
- Catalyst can be used in stand-alone units dedicated for the cracking of 1-butene.

### Advantages

- A higher yield of ethylene and propylene over prior catalysts with less C8+ by-products.
- Low temperature.
- High stability over time.

### Project Status

Catalyst was prepared and characterized. In addition, activity tests were done at laboratory bench scale to quantify propylene yield.

### Next Steps

Scale-up and pilot plant tests to further confirm catalyst activity and stability.

KFUPM seeks an industry partner to develop the technology leading to commercial exploitation. Petrochemicals companies in middle-east are welcome.

### Patent Protection

The issued patent US8623781 cover catalyst composition and method of synthesis. IP is owned by King Fahd University of Petroleum & Minerals (KFUPM).

### About KFUPM

King Fahd University of Petroleum & Minerals is a leading educational organization for science and technology. KFUPM Innovation & Industrial Relations is the IP management and technology licensing office tasked with taking innovation from lab to market place.

For further information please contact:

KFUPM Innovation Center

Email: [IP-License@kfupm.edu.sa](mailto:IP-License@kfupm.edu.sa)

Telephone: +966-13-860-7297