

## A Facile and Cost-Effective Process for Making Zeolite Catalyst



The invention is a novel microwave-assisted process for synthesizing MTT and ZSM-23 Zeolite catalyst for Fluid Catalytic Cracking units and oil refineries.

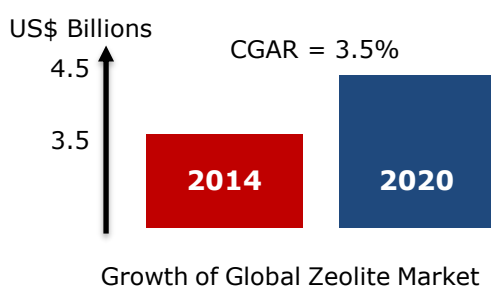
### The Invention

This technology relates to a sol-gel process for preparing MTT zeolites from aluminum solution. The process involves heating the reaction mixture in a microwave reactor to form an initial zeolite.

This low-cost technique allows more flexibility in controlling the characteristics of the produced Zeolite and gives full control on the size of the pores and the other mechanical properties.

### Market Need

Compared to conventional hydrothermal methods, this method is faster, incorporates lower cost and gives high functionality and control over the produced materials. The main target is to synthesize MTT zeolite catalyst for petrochemical and refining industry, i.e. FCC refineries. Frost & Sullivan estimates the petroleum refining catalyst (FCC) market in Saudi Arabia at over \$55 million in 2013. Saudi Arabian market forms 50% of the region's refining capabilities, is expected to witness phenomenal growth estimated at over 10% over the next few years.



### Applications

The current process can be used for synthesizing different types of zeolite catalysts including MTT and ZSM-23. These types of zeolites are highly used in the refining industry and in the Fluid Catalytic Cracking Unit.

### Competitive Advantage

This process involves the use of microwave technique as preheating source for synthesizing the Zeolite catalyst. This gives more controllability and functionality over the properties of the produced material. At the same time, saves energy compared to conventional heating methods.

### Project Status

A functioning prototype is developed, and zeolite catalyst is produced in a lab-scale. The invention is ready to be taken into a semi-industrial scale or pilot plant by enlarging the production line and setting pseudo-industrial relevant environment. Validating the efficiency of the process in relevant industrial environment is highly required.

### Looking for a Development Partner

In this stage, collaboration with catalyst developer is required. KFUPM is looking for an experienced catalyst developing partner for next stages of development and validation.

### Patent Protection

A patent application covering this method and **US9186659** was granted in the United States.

### About KFUPM

King Fahd University of Petroleum & Minerals, located in Saudi Arabia, is a leading educational organization for science and technology. KFUPM Innovation & Technology Transfer office is tasked with taking innovation from lab to market place.

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