

# **Comparison Of Downer And Riser Based Fluid Catalytic Cracking Process**

## **At High Severity Condition: A Pilot Plant Study**

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### **Summary**

Integration of refining and petrochemicals offers economic benefits to both the industries. Converting low value refinery products to high value petrochemicals require novel processes and extra investment. Though FCC is not a new process to the refining industry, it still has a potential for modification to enhance light olefins demanded by reformulated gasoline and the petrochemical industry. In this article a novel, High Severity FCC process based on the downer reactor is presented. Supported by the pilot plant study and comparison with riser, it is shown that the downer FCC reduces backmixing, which is the main cause of gasoline overcracking. Reduction of backmixing reduces coke and dry gas formation, resulting in increased yield of gasoline. Despite the operation at higher temperature, there is reduction in the thermal cracking. Though the light olefins yield is lower in case of downer, the total yield of useful products (gasoline + light olefins) is higher in downer as compared to the same from a riser. The increased yield of gasoline from downer can be converted to light olefins by using ZSM-5 based additives.

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