

# **Catalytic Cracking Of Cumene In A Riser Simulator: A Catalyst Activity Decay Model**

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## **Summary**

The present study reports the catalytic cracking of cumene using a novel CREC riser simulator. Two sizes of zeolite crystals (0.4 and 0.9  $\mu\text{m}$ ) are employed in the experiments. The goal is to develop and test, under relevant reaction conditions for FCC (temperature, contact time, reactant partial pressure, catalyst/oil ratio), a new catalytic activity decay model based on 'reactant conversion'. Kinetic and decay model parameters are estimated using regression analysis. Activation energies, deactivation constants, and Arrhenius preexponential constants are calculated with their respective confidence intervals. The lack of transport constraints on the cumene molecules inside the zeolites is confirmed by evaluating a modified Thiele modulus and effectiveness factors.

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