Kinetic modeling of $C_2 - C_6$ olefin interconversion over ZSM-5 Catalyst

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The naphtha catalyst cracking produce highly reactive olefin. Our research objective is to identify the reactivity of olefins. Reaction pathways and kinetic of $C_2 - C_6$ olefins cracking over ZSM-5 catalyst were investigated based on product distribution to develop a model. Experimental of the catalytic cracking of olefins were performed for temperature range of 450 - 650°C, space time of 0.375 min - 3.5 min and for partial pressure of 0.08- 0.23 atm. Kinetic modeling was carried out using power law method within catalytic cracking temperature (450-550°C). The model predicts the experimental product components with R^2 value of 0.8735 to 0.9718. Kinetic modeling results were analyzed with the sensitivity coefficient, to identify main route for ethylene and propylene production. In most of the cases, propylene and ethylene production routes were in competition as observed also in product distributions.