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Deactivation features related to the p-xylene oxidation mechanism over Pd catalysts

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Abstract

The total oxidation of p-xylene over two commercial metal-supported Pd catalysts is examined. The evolution of the process showed the following trends: abrupt drop of the main reaction rate below 280 °C; steeper decrease over the range 290–320 °C, and no noticeable change at higher temperature. The kinetic analysis gives evidence about change of the apparent activation energy in the different temperature regions. The observed phenomena are associated with the non-uniformity of the catalyst properties. Reaction mechanism is suggested assuming contribution of surface sites of different adsorption strength. The conditions determining stationary or non-stationary behavior of the reaction system are discussed.

Keywords: Xylene oxidation; Pd catalyst; Mechanism; Kinetics

Article Outline