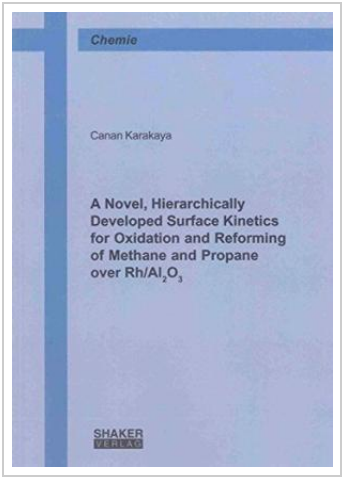

A Novel, Hierarchically Developed Surface Kinetics for Oxidation and Reforming of Methane and Propane over Rh/Al2O3

By Canan Karakaya

Shaker Verlag Okt 2013, 2013. Buch. Book Condition: Neu. 214x149x17 mm. Neuware - This thesis focuses on the development of a surface reaction mechanism for oxidation of H2 and CO, water-gas shift (WGS) as well as reverse water-gas shift (R-WGS) reactions and partial/total oxidation and steam/dry reforming of methane and propane over Rh/Al2O3 catalyst. The study aims at providing a better understanding of the reaction kinetics of synthesis gas production. A stagnation-flow reactor set-up has been developed and constructed to study the reaction kinetics of various gas fuels (e.g., H2, CO, CH4, C2H6, C3H8) and evaporated liquids (e.g., water, ethanol, methanol, iso-octane). The reactor configuration facilitates one-dimensional (1D) modeling of coupled diffusive and convective transport within the gas-phase boundary layer with detailed heterogeneous chemistry model. As a result, well-defined boundary conditions are created, and heat and mass transport effects are eliminated from the kinetic model. Boundary-layer composition profiles of the species are measured by using a micro-probe sampling technique. Gas-phase concentrations of the species are simultaneously analyzed by MS and FTIR. The stagnation disk is coated with a Rh/Al2O3 catalyst by spin-spray technique. Light microscopy (LM), scanning electron microscopy (SEM), and transmission electron microscopy (TEM) are applied for the determination...

Reviews

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