

Title: Study of dependence of the metal-oxide electron structure on the reactivity of these systems

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Abstract

The presented thesis focuses on studying the interaction between rhodium and cerium oxide and its impact on the reactivity. We investigated two different systems, Rh/CeO_x and Rh-CeO_x, by means of the photoelectron spectroscopy and the temperature programmed reactions. Rh/CeO_x stands for rhodium nanoparticles supported by cerium oxide thin film. We show that there is an electronic metal-substrate interaction between rhodium and cerium oxide. The type of the interaction depends on a degree of cerium oxide reduction and it has a tremendous impact on the reactivity of the system. On the other hand, Rh-CeO_x represents cerium oxide thin films doped by rhodium. We characterized the properties of the films with various concentration of rhodium. We show that the morphology, chemical composition and reactivity of the samples strongly depend on the concentration of the rhodium dopant.