

Study of CO Oxidation on Bare and TiO₂ -coated NiO/Ni(OH)₂

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CO oxidation reactivity of bare and TiO₂ -coated NiO/Ni(OH)₂ nanoparticles was studied. For the deposition of TiO₂ atomic layer deposition was used, and formation of three-dimensional island of TiO₂ on NiO/Ni(OH)₂ could be identified. Based on the data of X-ray Photoelectron Spectroscopy, we suggest that only Ni(OH)₂ existed on the surface, whereas NiO disappeared upon TiO₂ deposition. Both CO adsorption and CO oxidation took place on NiO/Ni(OH)₂ surfaces under our experimental conditions. CO adsorption was completely suppressed after TiO₂ deposition, whereas CO oxidation activity was maintained to large extent. It is proposed that bare NiO can uptake CO under our experimental condition, whereas hydroxylated surface of NiO can be active for CO oxidation.

Keywords: CO oxidation, Ni, oxide, atomic layer deposition (ALD), TiO₂