

Seminář odd. 26

Tenkých vrstev a nanostruktur

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TÉMA

Tailored formation of composite nanoparticles on TiO₂(110) surfaces

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Tailoring of self-organized formation of nanoparticles of more components and variety of shape is one of the big challenges in nowadays nanotechnology. It will be shown that by exploitation of the surface diffusion properties and the temperature/coverage/deposition rate dependence of the nucleation process, it is possible to control the growth of special bimetallic and oxide/metal composite nanoparticles on a TiO₂(110) surface.

In the first half of this talk, formation of Rh-Au core-shell nanoparticles will be presented on TiO₂(110) surface by physical vapour deposition (PVD) of Rh followed by exposure of Au at elevated sample temperature (500 K). The morphology of the self-organized bimetallic particles was studied by scanning tunneling microscopy (STM). The chemical composition of the particles were characterized by low energy ion scattering (LEIS) method. It will be demonstrated that the “seeding+growing” method described previously for growth of monometallic particles in narrow size distribution (Berkó, A. et al., J. Catal. 1999, 182, 511.) can be applied also for fabrication of bimetallic nanoparticles. In the second half of this presentation, we deal with the formation of oxide (TiO_x) decorated Rh nanoparticles and the temperature dependent nanowire formation of the admetal.