

Interaction of NO and CO with Surface of Pd Nanoclusters studied by XRD

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The developed recently technique of monitoring in situ a position, width and intensity of XRD profile during chemisorption or a surface reaction [1,2,3] was used to study interaction of NO and CO with Pd nanocrystal surface. The peaks evolution was interpreted via atomistic simulation. Additional insight into the surface morphology is provided by measuring time required for a transition of the Pd nanocrystals into beta hydride phase in hydrogen atmosphere. The adsorption of both gases hinders hydride transition slowing down the rate of hydrogen dissociation.

The study is an attempt to shed light on a possible surface reconstruction of the nanocrystals occurring on chemisorption. Up to date evidence for a similar phenomena could be only collected with surface science techniques on single crystals under very low gaseous pressure.

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