Forschungszentren

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Temperature Dependent CO Oxidation Mechanisms on Size-Selected Clusters

Abstract:
Using p-MBRS expts. and TPR as well as FTIR measurements, it could be shown that dissociative oxygen activation occurs in the same temp. range for small clusters in comparison to faceted nanoparticles (NPs) and Pd single crystals. Surprisingly, CO poisoning does not take place on small Pd clusters at temps. above 300 K. Furthermore, an oxygen activation has been found in this low temp. range which differs from the normal dissociative activation since it occurs only if CO is already adsorbed, before O2 adsorbs. Hence, the reactivity is promoted by CO under these conditions. This is in contrast to the normal Langmuir-Hinshelwood mechanism which has previously been obsd. for single crystals and faceted NPs. Cooperative effects in the adsorption of the reactants are most likely responsible for such unordinary behaviors. [on SciFinder(R)]

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