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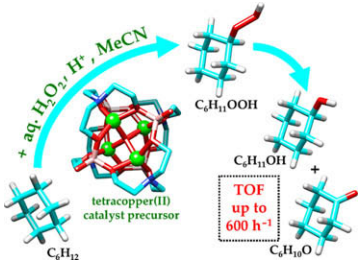
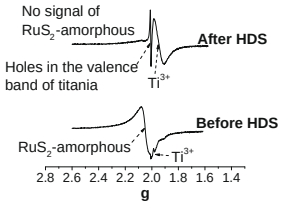
Contents

REGULAR ARTICLES

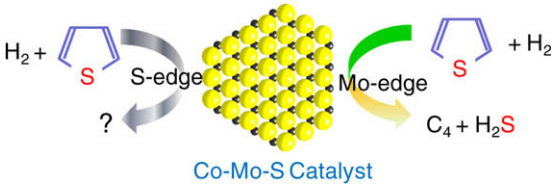


Kinetic and mechanistic features of mild alkane oxidations with a tetracopper(II) catalyst and an acid promoter are studied, revealing remarkably fast cyclohexane oxidation in the presence of HCl and unusual rate-accelerating role of water.

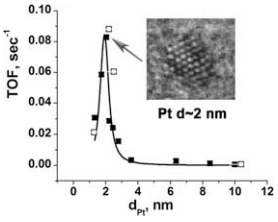


$$C_4H_4S + H_2 \longrightarrow C_4H_8S + C_4H_{10} + C_4H_8\text{'s} + H_2S$$

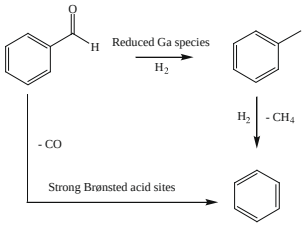
The HDS activity trend of Ru/TiO_2 with sulfidation temperature is explained by electronic interactions between the TiO_2 support and the Ru phases present on the surface (Ru^0 and RuS_2-pyrite).



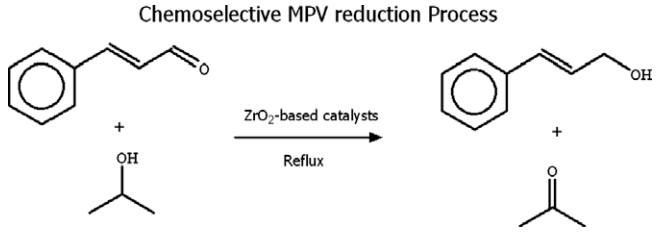
The intrinsic activity of Co–Mo–S for HDS is strongly dependent on its location and local structure as well as on the MoS_2-support interactions.



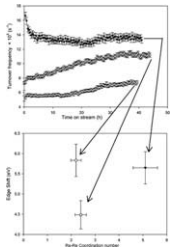
Catalytic activity of size-controlled platinum nanoparticles supported on the acid-pretreated γ-alumina has been measured in complete methane oxidation under lean conditions. The strong size sensitivity was shown to originate from the size dependence of the apparent activation energy of the methane oxidation and/or oxidation state of platinum in the catalytically active nanoparticles.



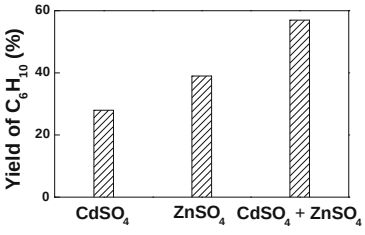
The deoxygenation of benzaldehyde over gallium-modified ZSM-5 catalysts results in two main products benzene and toluene, depending on the reaction conditions and pretreatment. In the absence of hydrogen, Ga/HZSM-5 catalyzes benzaldehyde decarbonylation resulting in benzene with CO as a side product. By contrast, when hydrogen is present, toluene (plus water) is the dominant product produced over reduced gallium sites by hydrogenation/hydrogenolysis. The formation of benzene and methane via dealkylation of toluene represents only a small contribution compared to the production of benzene via decarbonylation.



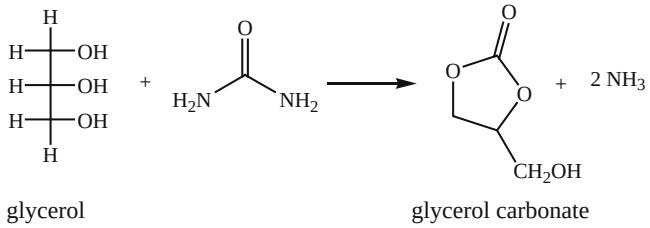
Pure and modified ZrO_2 catalysts were used in the Meerwein–Ponndorf–Verley reduction of cinnamaldehyde with 2-propanol. The most active sites are seemingly Bronsted acid sites of medium–high strength formed by doping ZrO_2 with boron. Modifying ZrO_2 with an alkaline-earth metal enhances its basicity, thereby reducing its catalytic activity although increasing its selectivity for the unsaturated alcohol.



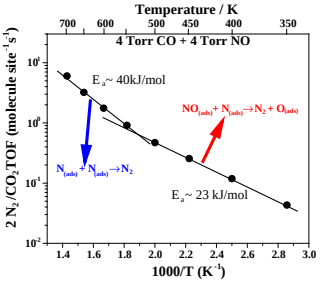
A family of γ-Al_2O_3-supported clusters of rhenium allowed resolution of the effects of cluster size and rhenium oxidation state on catalytic activity for *n*-butane conversion with H_2.



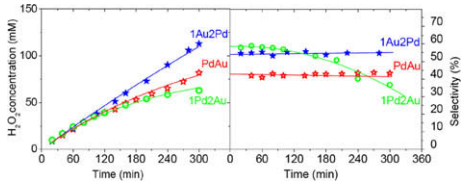
$CdSO_4$ and $ZnSO_4$ act as co-modifiers for RuLa/SBA-15 catalyst to enhance the selectivity in the partial hydrogenation of benzene to cyclohexene suppressing re-adsorption and stabilizing cyclohexene, respectively.



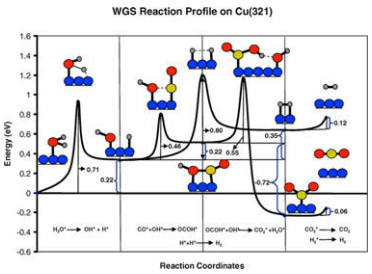
Glycerolysis of urea with γ-ZrP, a heterogeneous catalyst, is an efficient route to glycerol carbonate.



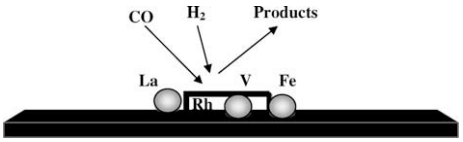
CO + NO = CO_2 + 1/2N_2 reaction undergoes almost stoichiometrically on AuPd(1 0 0) with two kinetic regimes. Considerable reaction rate is achieved below ~500 K due mainly to reduced CO/NO inhibition.



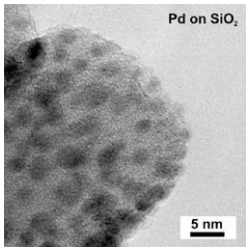
The preparation method of Pd–Au/zirconia catalysts strongly influences H_2O_2 direct synthesis. Au changes the chemical composition of the metallic particles, their morphology, and charge of the exposed Pd sites.



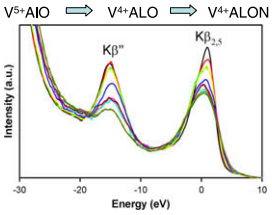
The effect of the surface steps in the mechanism of the water gas shift reaction catalyzed by Cu surfaces has been studied by means of periodic density functional calculations using the stepped Cu(3 2 1) surface as a realistic model of the catalyst surface. The calculations show that the reaction will proceed following the associative mechanism through the carboxyl intermediate with carboxyl dehydrogenation assisted by adsorbed OH.



Investigation of the kinetics for CO hydrogenation on La-, V-, and Fe-promoted SiO_2-supported Rh showed that the use of different promoters results in different rate-limiting steps.



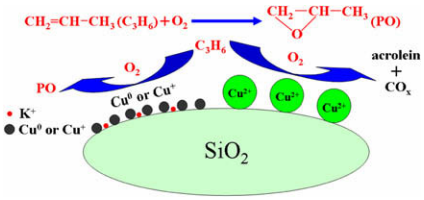
Ethene hydrogenation catalyzed by narrowly size-distributed Pd catalysts, produced by CVD, was investigated. A pronounced size dependence of TOF was found with a maximum at 3–4 nm.



Ammoxidation of propane

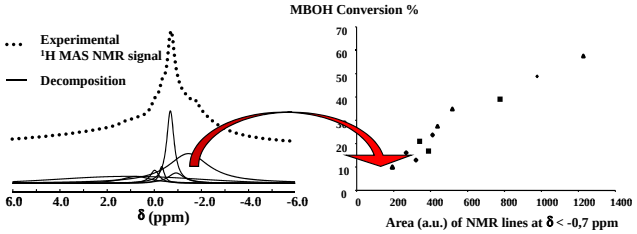
$$C_3H_8 + 2O_2 + NH_3 \rightarrow C_3H_3N + 4H_2O$$

In situ valence-to-core X-ray emission and X-ray absorption spectroscopies at V K-edge of V/Al/O catalysts showed that their activation on-stream was associated with reduction of vanadium in the bulk structure and nitridation only on the surface.



Cu^0 and Cu^+ species in small CuO particles modified by potassium acetate can catalyze C_3H_6 epoxidation by O_2 much efficiently. However, Cu^{2+} species mainly produces acrolein and CO_x.

RESEARCH NOTE



Hydroxylated MgO surfaces are very efficient as base catalysts. ^{1}H MAS NMR characterization shows that the OH groups at $\delta < -0.7$ ppm are the active basic sites in the model reaction of 2-methyl-3-butyn-2-ol conversion. From theoretical studies, they are assigned to low coordinated $O_{1C}H$ and $O_{2C}H$.