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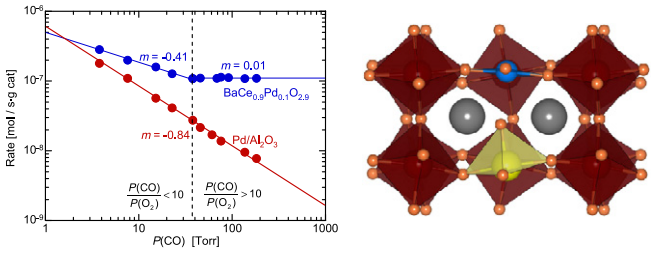
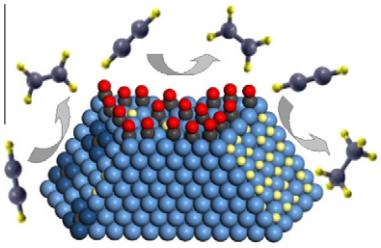
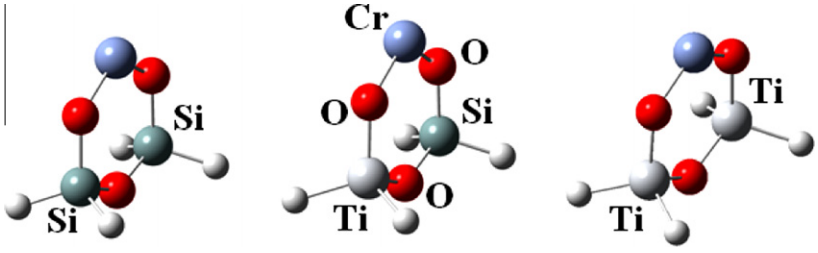


Low surface area, crystalline $Ba(Ce,Pd)O_3$ catalyzes CO oxidation using either oxygen adsorbed from the gas phase or labile lattice oxygen, and the rate law depends strongly on the $P(CO)/P(O_2)$ ratio. Catalytic activity is attributed to the presence of square-planar Pd(II) ions located on the perovskite *B*-sites, each adjacent to an oxygen vacancy.



The selectivity of alkyne hydrogenation on Pd depends on the subsurface chemistry. CO blocks the dynamic state of the catalyst and turn it into a robust, selective configuration.



DFT investigations combined with high-resolution XPS and ^1H MAS solid-state NMR characterization were carried out to elucidate the mechanism of Ti-modification on Phillips catalyst for ethylene polymerization.

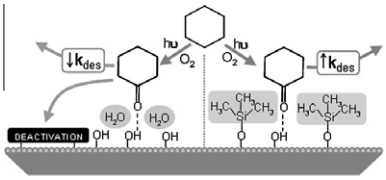
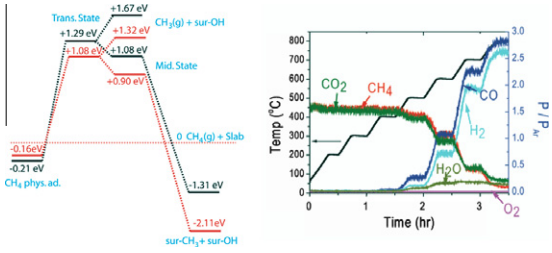
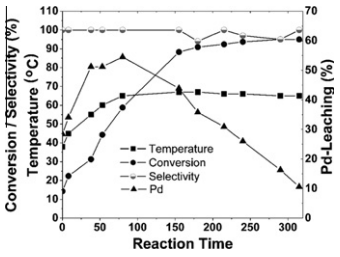


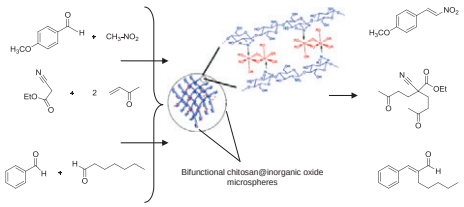
Photo-oxidation of cyclohexane over TiO_2 yields surface adsorbed Cyclohexanone. Desorption of this product is increased by silylation of the TiO_2 surface, reducing the rate of catalyst deactivation.



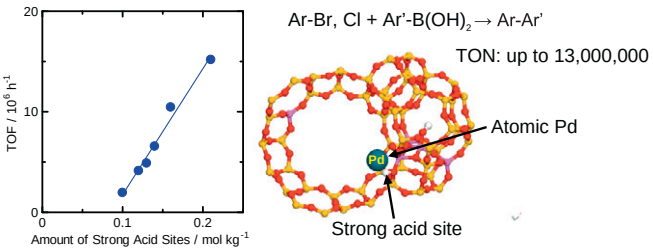
Energy level diagram (calculated) for breaking the C–H bond of methane. Steady state output from the reactor at different temperatures, for methane dry reforming. The catalyst is Pt-doped CeO_2.



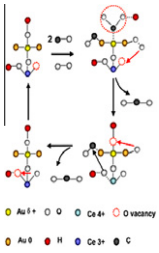
Various reaction parameters including temperature, solvent, base, substrates and additives influence the palladium leaching in Suzuki coupling reactions catalyzed by Pd/Al_2O_3. An efficient palladium dissolution–re-deposition process ensures high catalyst activity.



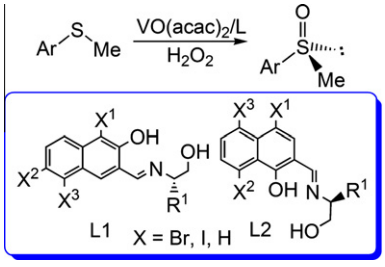
Mimicking enzyme action in solid materials: the cohabitation in close proximity of NH_2 from chitosan and acidic inorganic oxide in the replicated hybrid microsphere leads to cooperative action in catalysis.



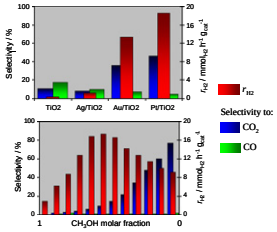
Pd loaded on USY zeolite exhibited very high activity in Suzuki–Miyaura reactions. The active species was proposed to be the atomic Pd anchored to the strong acid sites of USY.



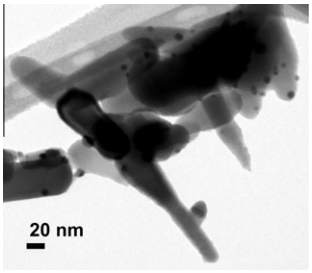
The $Au^0/Au^{\delta+}$ ratio and the amount of water-derived species on the surface of Au/CeO_2 catalysts were found to be two important parameters affecting the activities.



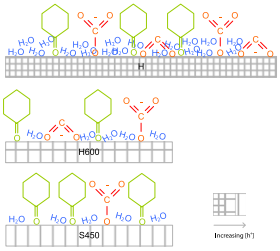
Chiral Schiff bases with a bromo- and iodo-functionalized naphthyl backbone proved to be efficient ligands for the vanadium-catalyzed asymmetric oxidation of aryl methyl sulfides in dichloromethane and toluene with up to 99% ee and moderate-to-high isolated yields.



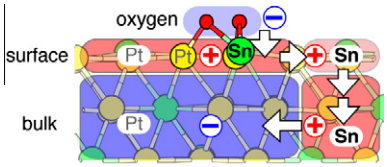
The rate of photocatalytic hydrogen production r_{H_2} from methanol/water vapours over noble metal (NB) – modified TiO_2 and the selectivity to different methanol oxidation products were found to correlate with the NB work function and with NB particles' size and dispersion. They sensibly varied with the H_2O/CH_3OH molar ratio in the gas-phase reactants mixture.



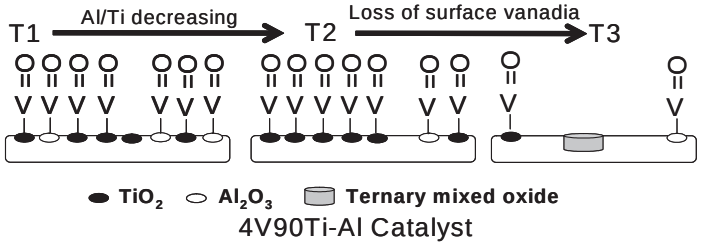
ZnO prepared by chemical vapour deposition with gold loaded by ultrasonication was very active for CO oxidation. The unique catalyst–substrate interaction (epitaxy related) might be related with the results observed.



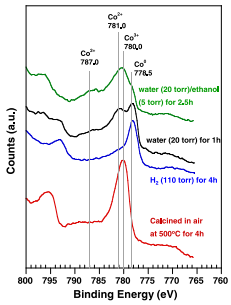
The catalyst stability in photocatalytic oxidation of cyclohexane and surface chemistry of TiO_2 are a strong function of the hydrophilicity of the surface and the crystal 'quality', affecting the concentration of reactive holes. Well-defined crystals with hydrophobic surfaces induce favorable catalyst properties.



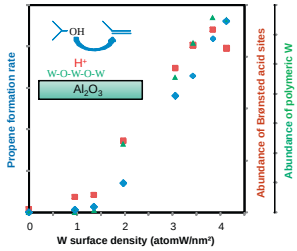
From combined experimental and theoretical approaches, we demonstrate the outstanding capacity of the $Pt_3Sn(1\,1\,1)$ surfaces for CO oxidation. The mediatory role of tin is elucidated from a charge transfer analysis.



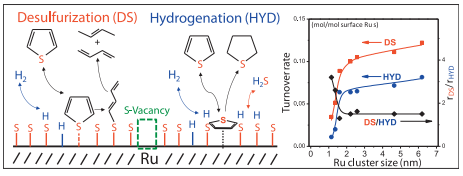
Surface active vanadia species present on TiO_2–Al_2O_3 mixed oxide support depends on loading and calcination temperature. Surface Al/Ti ratio varies with calcination temperature and depends on vanadia loading.



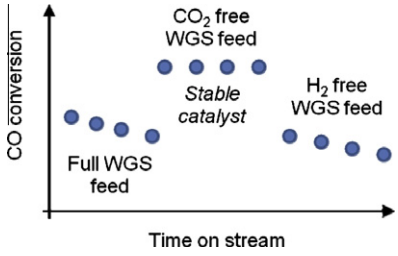
In situ XPS spectra (Co2p region) of the 10% Co/CeO_2–ZrO_2 catalyst as calcined in air at 500 °C for 4 h, and as exposed in different feed conditions at 450 °C.



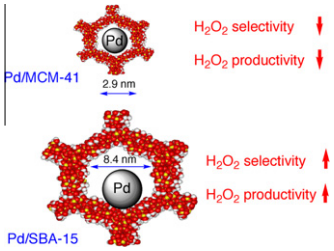
The relationship between the nature of W surface species, acidity and activity, was established for a series of WO_x/Al_2O_3 catalysts. Polymeric W surface species were found to be directly related to the abundance of relatively strong Brønsted acid sites and to the development of the catalytic activity for isopropanol dehydration.



Sulfur vacancies on Ru cluster surfaces bind thiophene and activate H_2 and H_2S in quasi-equilibrated steps that form intermediates involved in kinetically-relevant hydrogenation and H-assisted C–S bond cleavage reactions. Desulfurization and hydrogenation turnover rates increase with cluster size because weaker binding of sulfur atoms on larger Ru metal clusters lead to a larger number of sulfur vacancies during steady-state catalysis.



The predominant active state in $Au/CeZrO_4$ catalysts for low-temperature water gas shift is thought to be Au(0) and, through varying the reaction feed conditions, it was possible to enhance the stability of the catalysts significantly.



SBA-15 allows preparing palladium catalysts with enhanced productivity and selectivity in the direct synthesis of hydrogen peroxide by imparting Pd particles the proper size and distribution.