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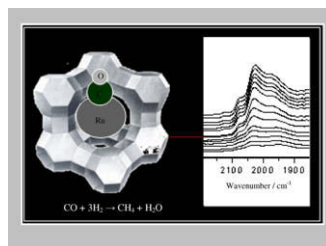
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**Activity, selectivity, and adsorbed reaction intermediates/reaction side products in the selective methanation of CO in reformate gases on supported Ru catalysts** pp 255–268

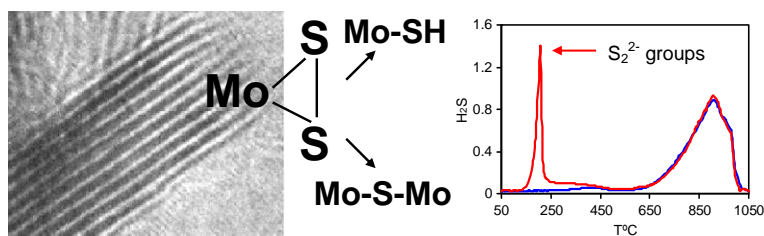
S. Eckle, Y. Denkwitz, R.J. Behm\*



The removal of CO in hydrogen rich containing feed gas via selective methanation was studied on two differently supported Ru catalysts. The kinetic activity is shown to be dependent on the amount of linearly adsorbed CO on Ru acting as active species.

**The influence of reducing and sulfiding conditions on the properties of unsupported MoS<sub>2</sub>-based catalysts** pp 269–280

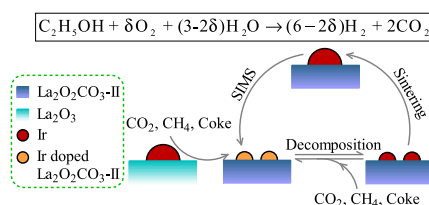
Pavel Afanasiev



Over-stoichiometric sulfur present at the edges of MoS<sub>2</sub> in the form of S<sub>2</sub><sup>2-</sup> moieties plays a crucial role for the HDS activity and HYD selectivity, as well as for the promotion of unsupported MoS<sub>2</sub> catalysts by nickel and cobalt.

**Efficient and stable oxidative steam reforming of ethanol for hydrogen production: Effect of *in situ* dispersion of Ir over Ir/La<sub>2</sub>O<sub>3</sub>** pp 281–290

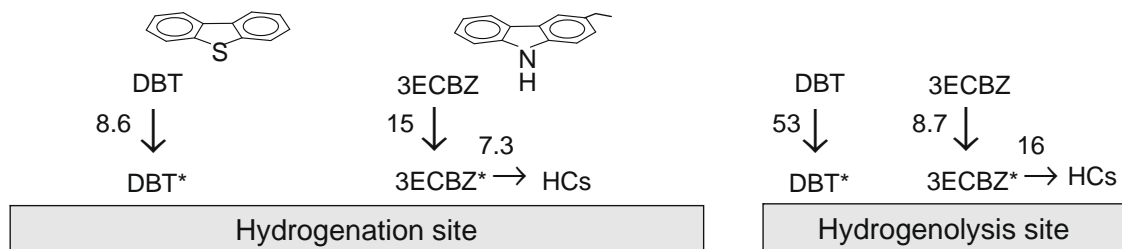
Hongqing Chen, Hao Yu\*, Feng Peng\*, Hongjuan Wang, Jian Yang, Minqiang Pan



Ir nanoparticles are *in situ* formed and dispersed over La<sub>2</sub>O<sub>3</sub> through the strong interaction between metal and support during the course of oxidative steam reforming of ethanol.

**Competitive adsorption of nitrogen species in HDS: Kinetic characterization of hydrogenation and hydrogenolysis sites** pp 291–301

Teh C. Ho\*, Liang Qiao

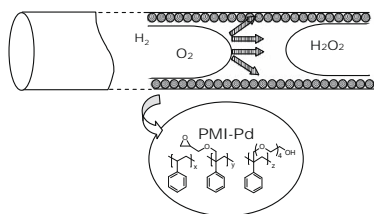


Shown here are relative adsorption constants for dibenzothiophene and 3-ethylcarbazole and relative rate constants for hydrodenitrogenation of 3-ethylcarbazole to hydrocarbons. Dibenzothiophene hydrodesulfurization is less inhibited by 3-ethylcarbazole on the hydrogenolysis sites.

**A wall-coated catalytic capillary microreactor for the direct formation of hydrogen peroxide**

pp 302–308

Jeck Fei Ng, Yuntong Nie, Gaik Khuan Chuah, Stephan Jaenicke\*

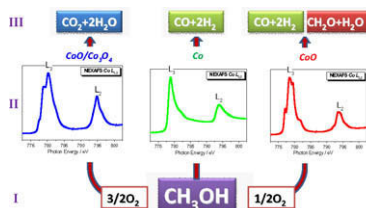


The direct formation of hydrogen peroxide from  $H_2$  and  $O_2$  was successfully carried out in a capillary microreactor under ambient conditions using palladium nanoparticles incarcerated in an amphiphilic polystyrene-based polymer.

**Methanol oxidation over model cobalt catalysts: Influence of the cobalt oxidation state on the reactivity**

pp 309–317

S. Zafeiratos\*, T. Dintzer, D. Teschner, R. Blume, M. Hävecker, A. Knop-Gericke, R. Schlögl

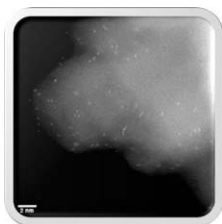


Methanol oxidation on cobalt: the relation between the gas phase composition (I), the cobalt oxidation state (II) and the dominant reaction paths (III), observed by combined *on-line* mass spectrometry (QMS) and in situ X-ray absorption spectroscopy (XAS). The X-ray absorption spectra of Co  $L_{3,2}$  edge were obtained on a cobalt crystal under reaction mixture at 520 K, using different methanol-to-oxygen mixing ratios.

**A site-isolated mononuclear iridium complex catalyst supported on MgO: Characterization by spectroscopy and aberration-corrected scanning transmission electron microscopy**

pp 318–328

Alper Uzun, Volkan Ortolan, Nigel D. Browning, Bruce C. Gates\*

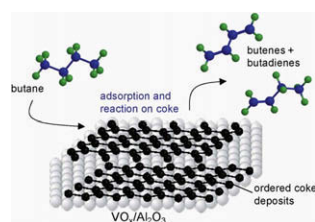


Aberration-corrected STEM images and EXAFS and IR spectra demonstrate that site-isolated iridium complexes are the predominant species in an MgO-supported catalyst used for ethene hydrogenation; the scattering centers indicate individual Ir atoms and clusters of several Ir atoms.

**Active coke: Carbonaceous materials as catalysts for alkane dehydrogenation**

pp 329–339

James McGregor\*, Zhenyu Huang, Edward P.J. Parrott, J. Axel Zeitler, K. Lien Nguyen, Jeremy M. Rawson, Albert Carley, Thomas W. Hansen, Jean-Philippe Tessonnier, Dang Sheng Su, Detre Teschner, Elaine M. Vass, Axel Knop-Gericke, R. Schlögl, Lynn F. Gladden

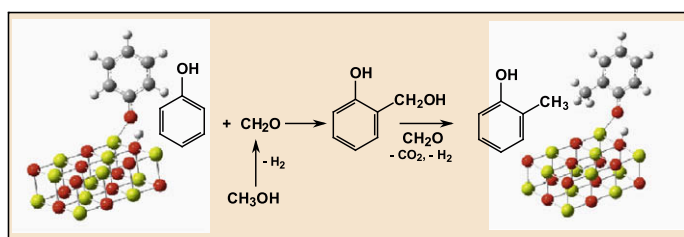


Carbonaceous material deposited on  $\text{VO}_x/\text{Al}_2\text{O}_3$  is shown to provide the catalytically active sites for *n*-butane dehydrogenation at 973 K. The activity of carbon is confirmed through studies on carbon nanofibres.

**Catalytic methylation of phenol on MgO – Surface chemistry and mechanism**

pp 340–350

Fabrizio Cavani\*, Luca Maselli, Sauro Passeri, Johannes A. Lercher\*

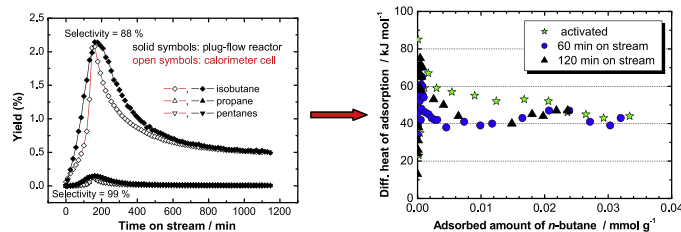


The mechanism of the gas-phase methylation of phenol with methanol, catalyzed by basic systems, is not a conventional electrophilic ring-substitution by the activated alcohol, but instead proceeds via the intermediate formation of formaldehyde and the regio- and chemo-selective ortho-hydroxymethylation of the phenolic ring by the aldehyde.

**Characterization of catalysts in their active state by adsorption microcalorimetry: Experimental design and application to sulfated zirconia**

pp 351–358

Sabine Wrabetz, Xiaobo Yang, Genka Tzolova-Müller, Robert Schlögl, Friederike C. Jentoft\*

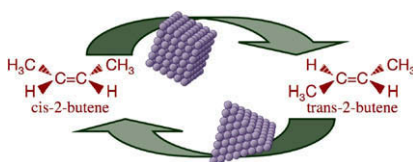


A calorimeter cell was used as a flow reactor to generate an active sulfated zirconia catalyst. Differential heats of butane adsorption measured subsequently in situ indicate that a small fraction of sites is altered as the catalyst changes its performance.

**Catalytic conversion of olefins on supported cubic platinum nanoparticles: Selectivity of (1 0 0) versus (1 1 1) surfaces**

pp 359–366

Ilkeun Lee, Francisco Zaera\*

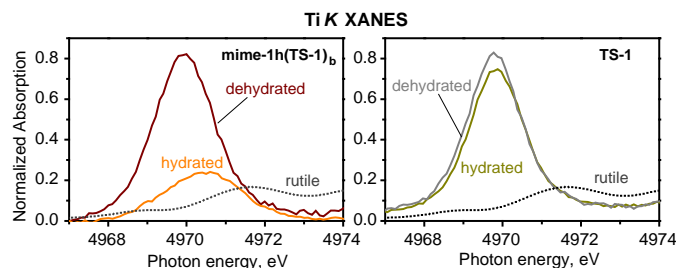


Colloidal chemistry was used to make catalysts consisting of cubic and tetrahedral platinum nanoparticles dispersed on silica supports. It was shown how this control on catalyst shape can be used to direct selectivity in catalytic olefin isomerization reactions.

## Alkene epoxidation with mesoporous materials assembled from TS-1 seeds – Is there a hierarchical pore system?

pp 367–375

Markus Reichinger, Wolfgang Schmidt, Maurits W.E. van den Berg, Alexander Aerts, Johan A. Martens, Christine E.A. Kirschhock, Hermann Gies, Wolfgang Grünert\*

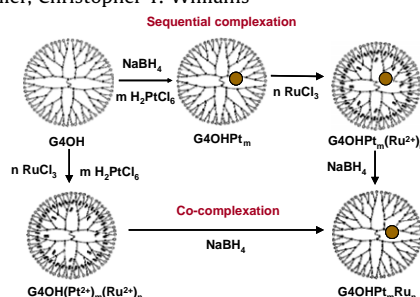


Characterization of ordered mesoporous solids synthesized from TS-1 seeds confirmed microporosity in mesopore walls. Highly accessible Ti sites in hydrophilic environment explain spectacular epoxidation activities with cyclohexene and complete failure with *n*-hexene.

## Preparation, characterization, and kinetic evaluation of dendrimer-derived bimetallic Pt–Ru/SiO<sub>2</sub> catalysts

pp 376–387

Dongxia Liu, Yaritza M. López-De Jesús, John R. Monnier, Christopher T. Williams\*

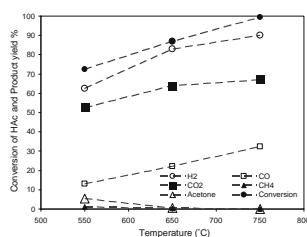


Pt–Ru dendrimer-metal nanocomposites were synthesized using co-complexation and sequential complexation methods as shown. The Pt–Ru bimetallic catalysts synthesized via dendrimer route were found to exhibit different structural properties and catalytic performance (i.e., activities, selectivities) for selective hydrogenation when compared to conventionally prepared Pt–Ru samples.

## Investigations on the properties of ceria–zirconia-supported Ni and Rh catalysts and their performance in acetic acid steam reforming

pp 388–396

Ekaterini Ch. Vagia, Angeliki A. Lemonidou\*

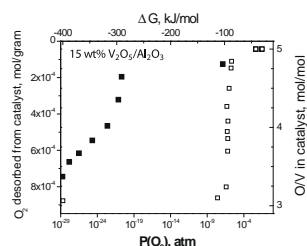


The performance of ceria–zirconia-supported Ni and Rh catalysts is investigated in steam reforming of acetic acid. High hydrogen yields and very low rates of carbonaceous depositions are observed over the Rh catalyst.

## The impact of redox properties on the reactivity of V<sub>2</sub>O<sub>5</sub>/Al<sub>2</sub>O<sub>3</sub> catalysts

pp 397–403

Ivan Baldychev, Raymond J. Gorte, John M. Vohs\*

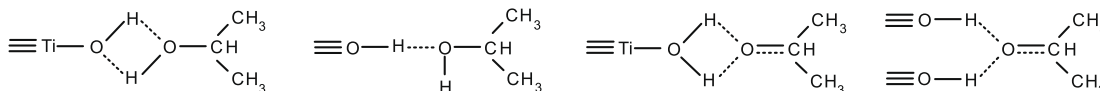


V<sub>2</sub>O<sub>5</sub>/Al<sub>2</sub>O<sub>3</sub> catalysts with different redox properties exhibited a similar activity for methanol selective oxidation suggesting that oxygen removal from the surface is not the rate-limiting step for this reaction.

**Influence of hydrogen bonding upon the TiO<sub>2</sub> photooxidation of isopropanol and acetone in aqueous solution**

pp 404–410

Carolina Salazar, Mark A. Nanny\*

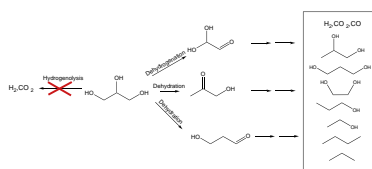


Kinetic studies revealed that photocatalytic oxidation of acetone and isopropanol in aqueous systems is susceptible to changes in the Brønsted acid/base character of TiO<sub>2</sub> caused by changes in pH.

**Towards understanding the bifunctional hydrodeoxygenation and aqueous phase reforming of glycerol**

pp 411–420

A. Wawrzetz, B. Peng, A. Hrabar, A. Jentys, A.A. Lemonidou, J.A. Lercher\*

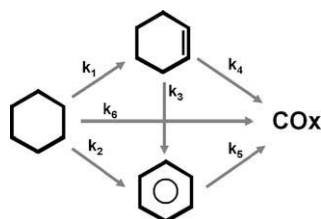


Glycerol is catalytically converted in aqueous phase over Pt/Al<sub>2</sub>O<sub>3</sub> via bifunctional pathways involving dehydrogenation, dehydration and decarboxylation/decarbonylation. C–C and C–O bond hydrogenolysis does not occur.

**Oxidative dehydrogenation of cyclohexane over alumina-supported vanadium oxide nanoliths**

pp 421–431

H. Feng, J.W. Elam, J.A. Libera, M.J. Pellin, P.C. Stair\*



In the oxidative dehydrogenation of cyclohexane by highly uniform vanadium oxide on alumina catalysts, the activity of vanadia polymers was higher than monomers for every reaction in the network ( $k_2$ – $k_6$ ) except for the formation of cyclohexene ( $k_1$ ) where the activity of monomers was higher.