



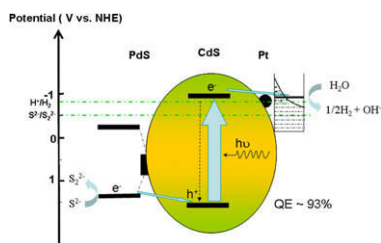
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Contents

PRIORITY COMMUNICATION

Visible-light-driven hydrogen production with extremely high quantum efficiency on Pt–PdS/CdS photocatalyst pp 165–168

Hongjian Yan, Jinhui Yang, Guijun Ma, Guopeng Wu, Xu Zong, Zhibin Lei, Jingying Shi, Can Li*

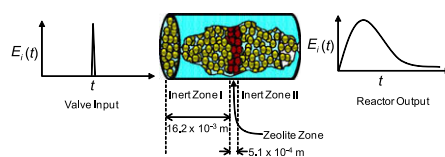


An artificial photocatalyst, Pt–PdS/CdS with the Pt and PdS, respectively acting as reduction and oxidation cocatalysts, can achieve quantum efficiency up to 93% in photocatalytic H₂ production from Na₂S–Na₂SO₃ aqueous solution under visible light irradiation.

REGULAR ARTICLES

Transport and sorption studies in beta and USY zeolites via temporal analysis of products (TAP) pp 169–181

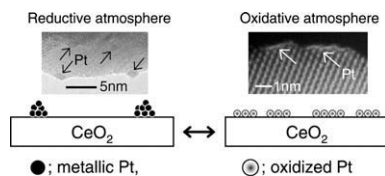
Subramanya V. Nayak, Mehmet Morali, Palghat A. Ramachandran, Milorad P. Dudukovic*



Our paper reports the methodology to obtain reliable estimates of intra-particle diffusivities and adsorption–desorption constants in large pore beta and USY zeolites by using single pulse TAP response experiments.

Reversible changes in the Pt oxidation state and nanostructure on a ceria-based supported Pt pp 182–190

Miho Hatanaka*, Naoki Takahashi, Naoko Takahashi, Toshitaka Tanabe, Yasutaka Nagai, Akihiko Suda, Hirofumi Shinjoh

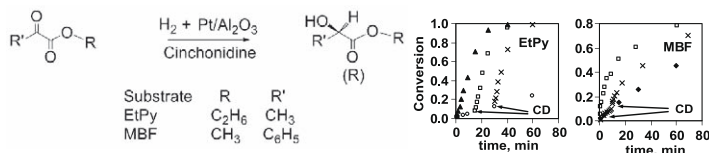


Depending on the treatment conditions, platinum on a ceria-based oxide support changes reversibly from a small metallic nanoparticle to an oxidized monolayer, providing evidence of Pt–O–Ce bond formation in the latter.

Additional data to the origin of rate enhancement in the enantioselective hydrogenation of activated ketones over cinchonidine modified platinum catalyst

pp 191–198

Emília Tálás*, József L. Margitfalvi, Orsolya Egyed

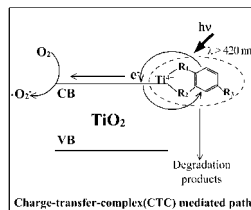


Upon hydrogenation of activated ketones the injection of cinchonidine (CD) results in immediate conversion increase, consequently the rate enhancement has to be an intrinsic property of the system.

Drastically enhanced visible-light photocatalytic degradation of colorless aromatic pollutants over TiO₂ via a charge-transfer-complex path: A correlation between chemical structure and degradation rate of the pollutants

pp 199–206

Nan Wang, Lihua Zhu, Yingping Huang, Yuanbin She, Yanmin Yu, Heqing Tang*

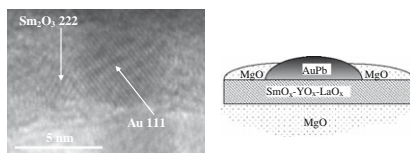


Charge transfer complexes enhance the photocatalytic activity of titania for degradation of organic pollutants under visible light.

Role of modifiers in multi-component MgO-supported Au catalysts designed for preferential CO oxidation

pp 207–217

András Tompos*, József L. Margitfalvi, Ervin Gy. Szabó, Zoltán Pászti, István Sajó, György Radnóczy

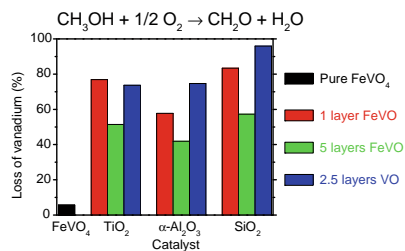


MgO-supported gold catalysts modified by V, Pb, Sm, La and Y have been investigated in order to elucidate the role of modifiers in preferential CO oxidation. Synergistic effect of different components on the catalytic performance has been observed which is due to alloying of gold with Pb and modification of the nanoenvironment of gold by metal oxides.

Stability and performance of supported Fe–V-oxide catalysts in methanol oxidation

pp 218–227

Robert Häggblad, Mariano Massa, Arne Andersson*

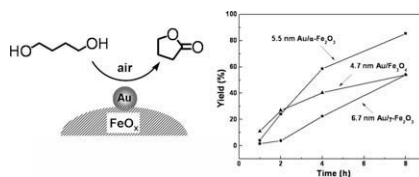


A considerable loss of the vanadium supported on TiO₂, α-Al₂O₃ and SiO₂ is observed after 5 days of operation in methanol oxidation with 10% methanol and 10% O₂ at 300 °C and at differential conditions.

Remarkable support crystal phase effect in Au/FeO_x catalyzed oxidation of 1,4-butanediol to γ -butyrolactone

pp 228–235

Jie Huang, Wei-Lin Dai*, Kangnian Fan

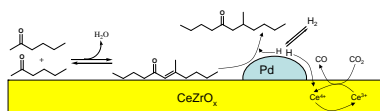


Gold supported on different iron oxides shows different catalytic behavior in the oxidation of 1,4-butanediol to γ -butyrolactone. The support effect is more significant than the gold particle size effect.

Vapour-phase C–C coupling reactions of biomass-derived oxygenates over Pd/CeZrO_x catalysts

pp 236–249

Edward L. Kunkes, Elif I. Gürbüz, James A. Dumesic*

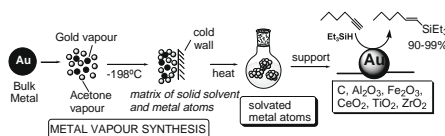


The primary pathway for aldol condensation/hydrogenation of 2-hexanone on Pd/CeZrO_x yields 7-methyl-5-undecanone. Inhibiting effects of CO₂ are ameliorated by the presence of Ce³⁺, formed by H₂ spillover from Pd and leading to reduction of CO₂ to CO.

Solvated gold atoms in the preparation of efficient supported catalysts: Correlation between morphological features and catalytic activity in the hydrosilylation of 1-hexyne

pp 250–257

Laura Antonella Aronica, Eleonora Schiavi, Claudio Evangelisti, Anna Maria Caporusso*, Piero Salvadori, Giovanni Vitulli, Luca Bertinetti, Gianmario Martra

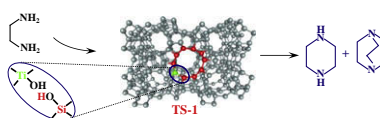


Supported (C, Al₂O₃, Fe₂O₃, CeO₂, TiO₂ and ZrO₂) gold nanoparticles were easily prepared starting from gold/acetone solutions generated according to the Metal Vapour Synthesis technique. The catalytic activity of Au nanoclusters was tested in the hydrosilylation of 1-hexyne, and it resulted influenced by two major factors: particle size and support selection.

Intermolecular condensation of ethylenediamine to 1,4-diazabicyclo[2,2,2]octane over TS-1 catalysts

pp 258–267

Yong Wang, Yueming Liu*, Xiaohong Li, Haihong Wu, Mingyuan He, Peng Wu*

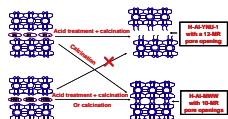


The internal silanols of TS-1 are active and selective for the intermolecular condensation of ethylenediamine to piperazine and triethylenediamine.

Synthesis, characterization, and catalytic properties of H-Al-YNU-1 and H-Al-MWW with different Si/Al ratios

pp 268–278

Weibin Fan*, Shuquan Wei, Toshiyuki Yokoi, Satoshi Inagaki, Junfen Li, Jianguo Wang, Junko N. Kondo, Takashi Tatsumi*

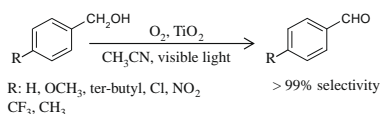


H-Al-YNU-1 with a 12-MR pore opening and H-Al-MWW with different Si/Al ratios were postsynthesized in the presence of piperidine (PI) and hexamethyleneimine (HMI) with the ion-exchange of Na^+ with NH_4^+ unnecessary. H-Al-YNU-1 was not obtained by acid treating and subsequently calcining the Al-MWW lamellar precursor synthesized with HMI, but it could be prepared in such a way when PI was used, and showed high activity in alkylation of anisole with $\text{C}_6\text{H}_5\text{CH}_2\text{OH}$ and acylation of anisole with $(\text{CH}_3\text{CO})_2\text{O}$.

Selective photocatalytic oxidation of benzyl alcohol and its derivatives into corresponding aldehydes by molecular oxygen on titanium dioxide under visible light irradiation

pp 279–285

Shinya Higashimoto*, Naoya Kitao, Norio Yoshida, Teruki Sakura, Masashi Azuma, Hiroyoshi Ohue, Yoshihisa Sakata

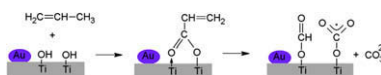


Highly efficient selective photocatalytic oxidation of benzyl alcohol and its derivatives into benzaldehydes has been realized on TiO_2 under visible light irradiation.

Acrylate and propoxy-groups: Contributors to deactivation of Au/TiO₂ in the epoxidation of propene

pp 286–290

Aida Ruiz, Bart van der Linden, Michiel Makkee*, Guido Mul

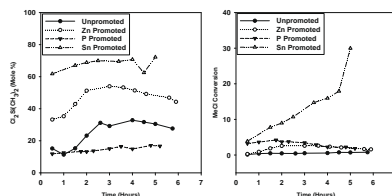


An additional route to deactivation of Au/TiO₂ in the oxidation of propene is proposed.

Effects of individual promoters on the Direct Synthesis of methylchlorosilanes

pp 291–298

Alexander D. Gordon, B.J. Hinch, Daniel R. Strongin*

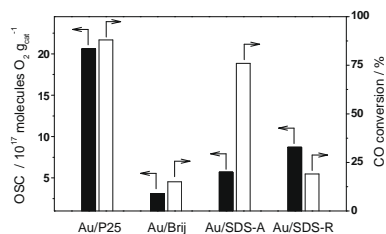


The Direct Synthesis, or Rochow Synthesis, produces methylchlorosilanes through the reaction of methyl chloride (MeCl) with a contact mass composed of Si and Cu (catalyst), which is promoted with part-per-million amounts of Zn, Sn, and P. Attenuated total reflection infrared spectroscopy was used to probe the surface composition of the contact mass *in situ* as a function of promoter and these results were correlated to product distributions that were determined by flow reactor studies. One significant correlation was that the presence of Sn led to an enhancement in CH_3 surface concentration, MeCl conversion, and selectivity toward dimethyldichlorosilane product relative to unpromoted contact masses and contact masses promoted with zinc; it was noted that P-promoted surfaces also enhance surface CH_3 concentration, but did not exhibit the increase in MeCl conversion and selectivity toward dimethyldichlorosilane.

Stable active oxygen on mesoporous Au/TiO₂ supported catalysts and its correlation with the CO oxidation activity

pp 299–307

A. Tost, D. Widmann, R.J. Behm*

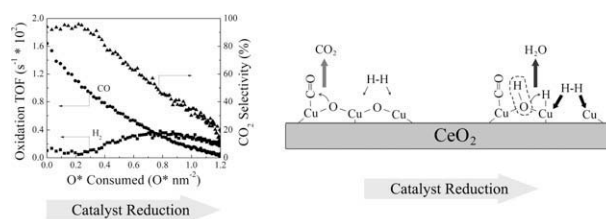


The reversible uptake and reactive removal of active oxygen, and its relation to the CO oxidation activity were investigated on different mesoporous Au/TiO₂ catalysts and on a non-porous Au/TiO₂ catalyst. Variation of the support has a distinct influence on the ability to store active oxygen and its relation to the activity.

Study of active sites and mechanism responsible for highly selective CO oxidation in H₂ rich atmospheres on a mixed Cu and Ce oxide catalyst

pp 308–319

Christopher S. Polster, Hari Nair, Chelsey D. Baertsch*

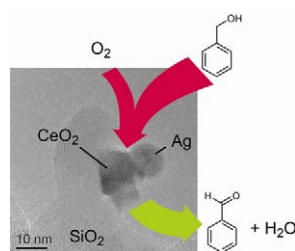


Reaction mechanisms and active sites are studied for CO and H₂ oxidation on CuO_x-CeO₂ catalysts. High selectivity results primarily from an inhibition of H₂ dissociation by oxidized sites.

Selective liquid-phase oxidation of alcohols catalyzed by a silver-based catalyst promoted by the presence of ceria

pp 320–330

Matthias J. Beier, Thomas W. Hansen, Jan-Dierk Grunwaldt*

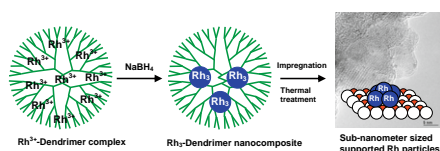


A physical mixture of Ag-SiO₂ and CeO₂ nanoparticles catalyzes the selective oxidation of alcohols to the corresponding aldehydes in an efficient way.

Dendrimer-mediated synthesis of subnanometer-sized Rh particles supported on ZrO₂

pp 331–342

Attilio Siani, Oleg S. Alexeev, D. Samuel Deutsch, John R. Monnier, Paul T. Fanson, Hirohito Hirata, Shinichi Matsumoto, Christopher T. Williams, Michael D. Amiridis*

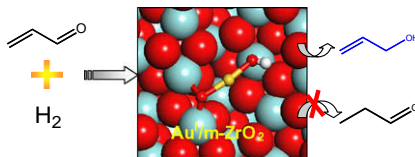


Nearly uniform Rh particles with sizes below 1 nm were prepared on a ZrO₂ support via a dendrimer-mediated synthetic route. The coordination environment of Rh was monitored by EXAFS during all preparation steps and HRTEM was used to image the resulting supported Rh nanoparticles. The structure-sensitive ethane hydrogenolysis reaction was used to probe the catalytic properties of the Rh/ZrO₂ materials produced.

Oxide-supported single gold catalyst for selective hydrogenation of acrolein predicted from first principles

pp 343–350

Chuan-Ming Wang, Kang-Nian Fan, Zhi-Pan Liu*

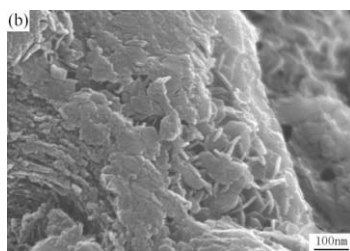


First principle calculations show that single Au cations present at ZrO₂ stepped sites at room temperatures can selectively hydrogenate acrolein to allyl alcohol.

Enhanced metal dispersion and hydrodechlorination properties of a Ni/Al₂O₃ catalyst derived from layered double hydroxides

pp 351–358

Jun-Ting Feng, Yan-Jun Lin, David G. Evans, Xue Duan, Dian-Qing Li*

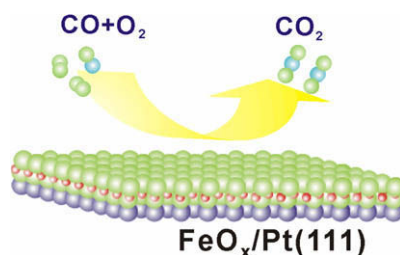


A Ni²⁺–Al³⁺–CO₃²⁻-layered double hydroxide precursor has been synthesized in the pores of spherical γ -Al₂O₃ particles. After calcination and reduction, a highly dispersed Ni/ γ -Al₂O₃ catalyst was obtained.

Monolayer iron oxide film on platinum promotes low temperature CO oxidation

pp 359–368

Y.-N. Sun, Z.-H. Qin, M. Lewandowski, E. Carrasco, M. Sterrer, S. Shaikhutdinov*, H.-J. Freund

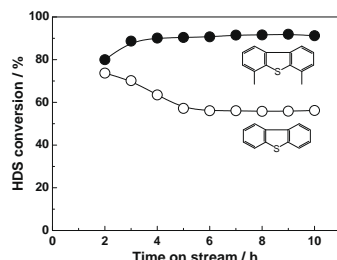


Ultrathin FeO(1 1 1) films grown on Pt(1 1 1) unexpectedly showed high activity towards CO oxidation. The reaction proceeds through the formation of a well-ordered, oxygen-rich FeO_x (1 < x < 2) film. In CO-rich ambient the film dewets the Pt surface, ultimately resulting in highly dispersed iron oxide particles on Pt(1 1 1).

Preparation of high-performance MoP hydrodesulfurization catalysts via a sulfidation–reduction procedure

pp 369–379

Yang Teng, Anjie Wang*, Xiang Li, Jianguo Xie, Yao Wang, Yongkang Hu

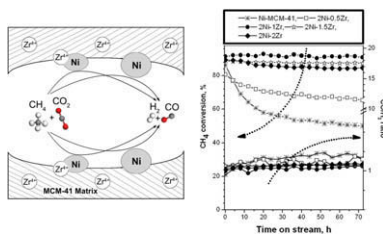


A sulfidation–reduction procedure was used to prepare a MoP/MCM-41 catalyst, which showed considerably a higher hydrodesulfurization (HDS) activity, especially for 4,6-dimethylbenzothiophene, than the counterpart prepared by conventional method.

MCM-41 supported nickel-based bimetallic catalysts with superior stability during carbon dioxide reforming of methane: Effect of strong metal–support interaction

pp 380–390

Dapeng Liu, Xian Yang Quek, Wei Ni Evelyn Cheo, Raymond Lau, Armando Borgna, Yanhui Yang*



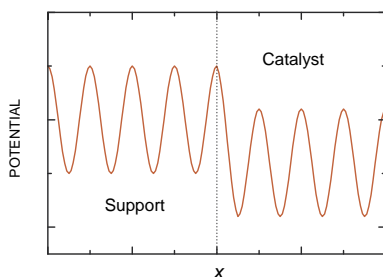
Ni–Zr–MCM-41 catalysts exhibited remarkably enhanced catalytic activity and long-term stability due to the anchoring effect of Zr⁴⁺ and partial activation of CO₂ by Zr⁴⁺.

LETTER TO THE EDITOR

Mass transport on composite catalytic surfaces

pp 391–392

Vladimir P. Zhdanov



Schematic potential energy for adsorbate diffusion along the surface.

RESPONSE TO LETTER TO THE EDITOR

Response to the letter “Mass transport on composite catalytic surfaces by V. Zhdanov”

pp 393–394

T.G. Mattos, Fábio D.A. Araújo Reis*