Journal of Catalysis 279 (2011) iii–vii

Contents lists available at ScienceDirect

Journal of Catalysis

journal homepage: www.elsevier.com/locate/jcat

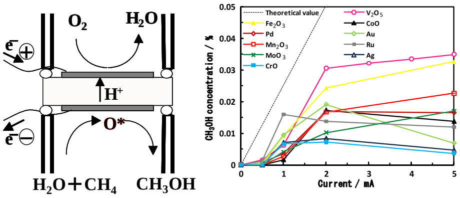
Journal of Catalysis Vol. 279, Issue 2, 2011

Contents

REGULAR ARTICLES

Efficient and selective formation of methanol from methane in a fuel cell-type reactor **pp 233–240**

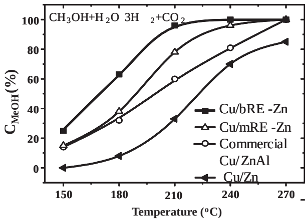
Byungik Lee, Takashi Hibino*



In a fuel cell-type reactor, a V_2O_5/SnO_2 anode exhibited the highest current efficiency for methanol production and selectivity toward methanol of 61.4% and 88.4%, respectively, at 100 °C.

Promotion of a copper–zinc catalyst with rare earth for the steam reforming of methanol at low temperatures **pp 241–245**

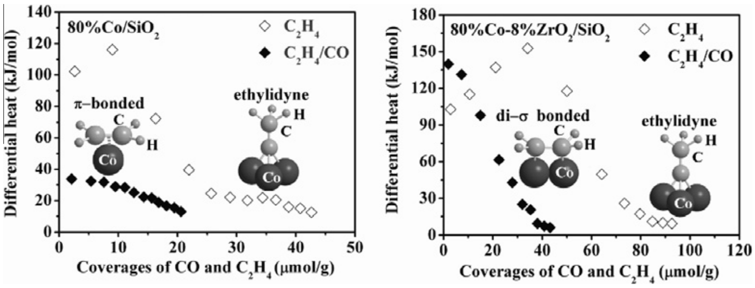
Ming-Chung Tsai, Jung-Hui Wang, Chia-Chieh Shen, Chuin-Tih Yeh*



The activity of Cu/Zn catalysts toward the steam reforming of methanol was substantially enhanced by an addition of rare earth (RE).

Microcalorimetric adsorption studies of highly loaded Co–ZrO_2/SiO_2 catalysts for Fischer–Tropsch synthesis **pp 246–256**

Liang Chen, Jianyi Shen*

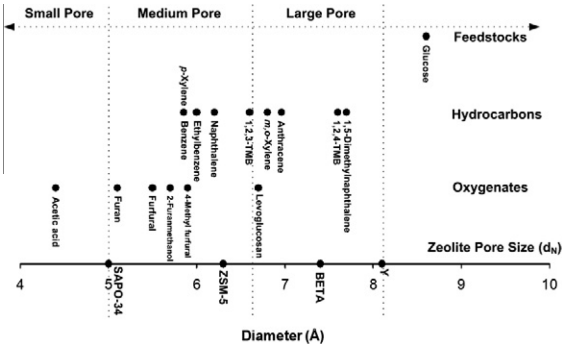


While the adsorption of C_2H_4 on clean cobalt surface led to the formation of ethylidyne, π and di-σ-bonded C_2H_4 might form on the CO-preadsorbed 80%Co/SiO_2 and 80%Co–8%ZrO_2/SiO_2, respectively.

Investigation into the shape selectivity of zeolite catalysts for biomass conversion pp 257–268

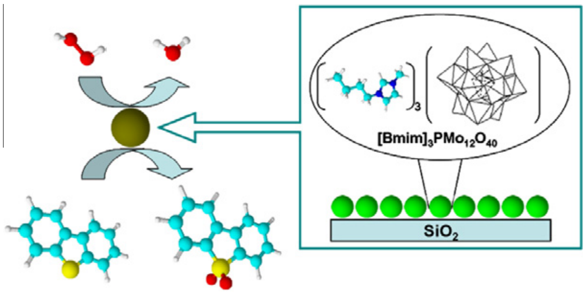
Jungho Jae, Geoffrey A. Tompsett, Andrew J. Foster, Karl D. Hammond, Scott M. Auerbach, Raul F. Lobo, George W. Huber*

The influence of zeolite pore size and shape selectivity on the conversion of glucose to aromatics was studied with a range of zeolite catalysts. The kinetic diameters of the products and reactants were estimated to determine whether the reactions occur inside the pores or at external surface sites for the different zeolite catalysts.



Oxidative desulfurization of dibenzothiophene and diesel over $[Bmim]_3PMo_{12}O_{40}$ pp 269–275

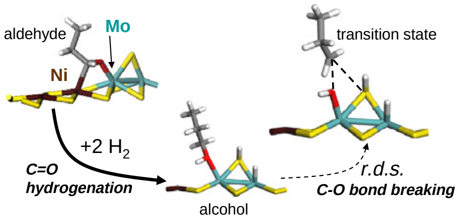
Jian Zhang, Anjie Wang*, Xiang Li, Xuehu Ma



$[Bmim]_3PMo_{12}O_{40}/SiO_2$, which is amphiphilic, exhibits high catalytic performance in the oxidation of dibenzothiophene and a real diesel. Quinoline and carbazole show slight promoting effects, whereas indole strongly inhibits the oxidation.

Hydrodeoxygenation pathways catalyzed by MoS_2 and NiMoS active phases: A DFT study pp 276–286

C. Dupont, R. Lemeur, A. Daudin, P. Raybaud*

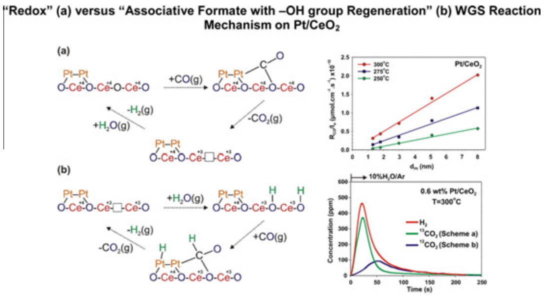


The hydrodeoxygenation pathway catalyzed by MoS_2 and NiMoS is elucidated: the bidentate adsorption mode of aldehyde on the Ni—Mo site facilitates the C═O hydrogenation into alcohol further converted by C—O cleavage according to a nucleophilic substitution by sulfhydryl.

"Redox" vs "associative formate with –OH group regeneration" WGS reaction mechanism on Pt/CeO_2: Effect of platinum particle size pp 287–300

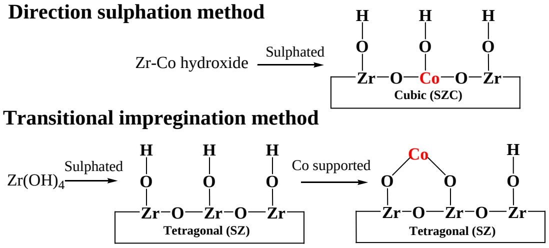
Christos M. Kalamaras, Sofia Americanou, Angelos M. Efstathiou*

A novel transient isotopic kinetic technique combined with infrared spectroscopy and mass spectrometry applied to platinum–ceria catalysts in the water-gas shift process reveals that a redox mechanism on sites at the Pt–ceria interface dominates the kinetics.



A direct sulfation method for introducing the transition metal cation Co^{2+} into ZrO_2 with little change in the Brønsted acid sites pp 301–309

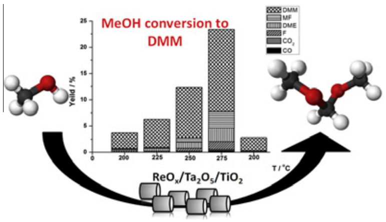
Xiangjie Wang, Huayu Wang, Yongchun Liu, Fudong Liu, Yunbo Yu*, Hong He*



Direct sulfation of Zr–Co hydroxides provides significant advantage for holding Brönsted acid sites than traditional impregnation.

Novel approach to rhenium oxide catalysts for selective oxidation of methanol to DMM pp 310–318

Olesya A. Nikonova*, Mickaël Capron, Ge Fang, Jérémy Faye, Anne-Sophie Mamede, Louise Jalowiecki-Duhamel, Franck Dumeignil, Gulaim A. Seisenbaeva

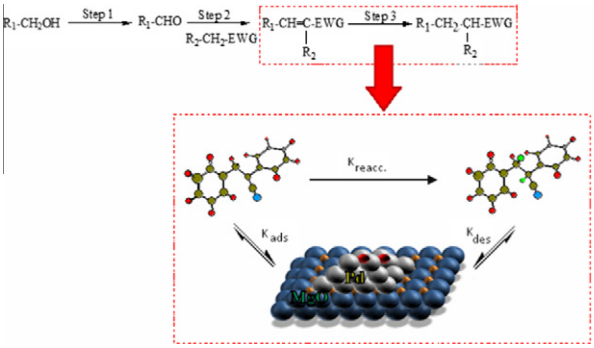


New rhenium and rhenium–tantalum catalysts are prepared using alkoxide molecular precursors. The presence of the chemically bound oxidative (perrhenate) and acidic (tantalum oxide) components in the catalyst facilitates one-step production of DMM.

Monoalkylations with alcohols by a cascade reaction on bifunctional solid catalysts: Reaction kinetics and mechanism pp 319–327

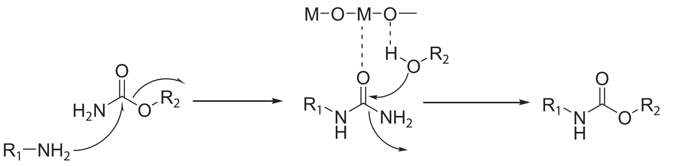
Avelino Corma*, Tania Ródenas, María J. Sabater*

Pd-MgO catalyzes the α-monoalkylation of activated methylenic compounds with alcohols through a cascade process without external supply of hydrogen. A kinetic study shows that the rate controlling step for the one-pot sequence is the hydrogenation of the olefin by the surface metal hydrides.



N-substituted carbamates syntheses with alkyl carbamates as carbonyl source over Ni-promoted Fe_3O_4 catalyst pp 328–336

Jianpeng Shang, Xiaoguang Guo, Feng Shi*, Yubo Ma, Feng Zhou, Youquan Deng*

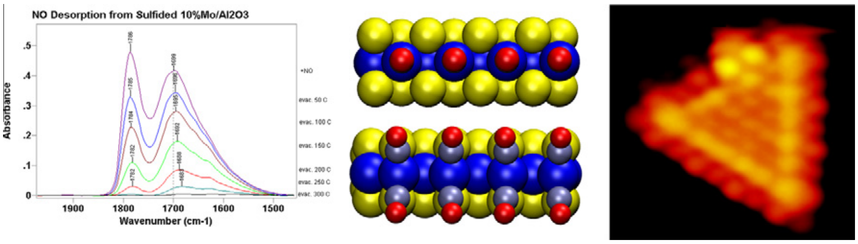


R_1 = alkyl or aryl; R_2 = methyl, ethyl or butyl; 190 °C, 5-12 h, 1.5-2.2MPa; Yield: 90-98%

A magnetic Ni/Fe_3O_4 catalyst was developed for the syntheses of N-substituted carbamates with amines and alkyl carbamates. Reaction pathway investigation revealed that the N-substituted carbamate was formed via urea intermediate.

Spectroscopy, microscopy and theoretical study of NO adsorption on MoS_2 and Co–Mo–S hydrotreating catalysts pp 337–351

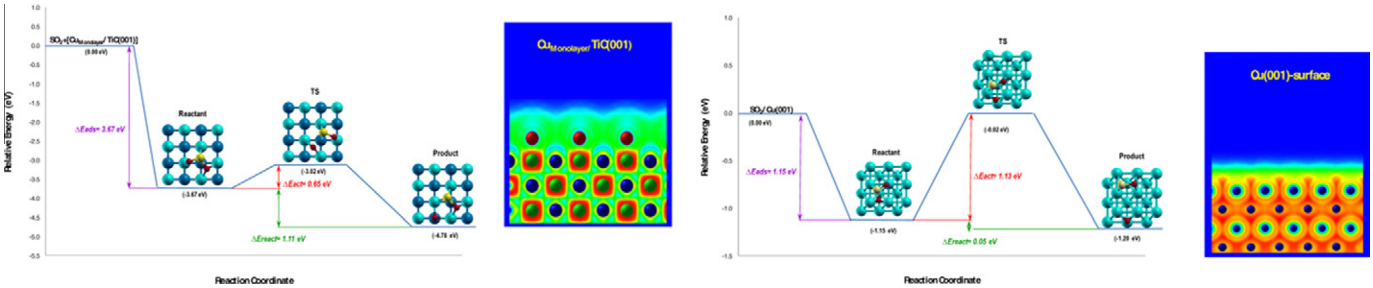
Nan-Yu Topsøe*, Anders Tuxen, Berit Hinnemann*, Jeppe V. Lauritsen*, Kim G. Knudsen, Flemming Besenbacher, Henrik Topsøe



A combination of IR spectroscopy, STM and DFT is used to gain atomic-scale insight into NO adsorption on MoS2 and Co–Mo–S hydrotreating catalysts.

Interaction of SO_2 with Cu/TiC(0 0 1) and Au/TiC(0 0 1): Toward a new family of DeSO$_x$ catalysts pp 352–360

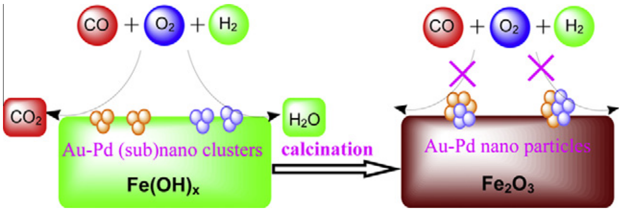
Leticia Feria, José A. Rodriguez, Tomas Jirsak, Francesc Illas*



Experiments and theory consistently indicate that the Cu/TiC(0 0 1) system is more active toward SO_2 dissociation than the Au/TiC(0 0 1) system. This type of systems may provide alternative and efficient DeSO$_x$ catalysts.

A novel Au&Pd/Fe(OH)$_x$ catalyst for CO + H_2 co-oxidations at low temperatures pp 361–365

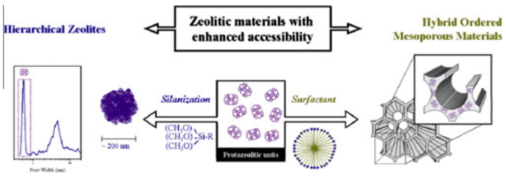
Botao Qiao, Aiqin Wang, Masashi Takahashi, Yanjie Zhang, Junhu Wang, Youquan Deng*, Tao Zhang*



Au&Pd/Fe(OH)$_x$ catalyst with separate Au and Pd active sites was designed and successfully prepared, over which the CO oxidation occurred on Au active sites while the H_2 oxidation occurred on Pd active sites, thus the co-oxidation of CO + H_2 was realized at ambient temperature.

Acidic and catalytic properties of hierarchical zeolites and hybrid ordered mesoporous materials assembled from MFI protozeolitic units pp 366–380

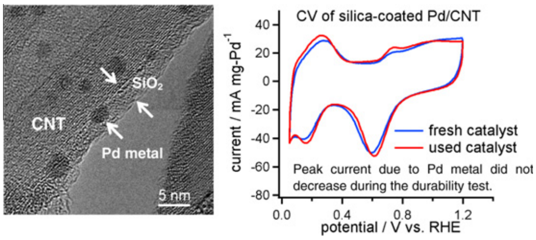
D.P. Serrano*, R.A. García, G. Vicente, M. Linares, D. Procházková, J. Čejka*



Hierarchical zeolites and hybrid ordered mesoporous materials have been prepared using MFI protozeolitic units as starting building blocks. Both types of materials combine the benefits derived from improved accessibility and strong acidity, which have a noticeable effect on their catalytic properties in 1,2-epoxyoctane isomerisation and Friedel–Crafts acylation.

Highly durable carbon nanotube-supported Pd catalysts covered with silica layers for the oxygen reduction reaction **pp 381–388**

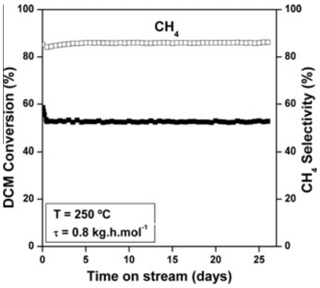
Sakae Takenaka*, Noato Susuki, Hiroaki Miyamoto, Eishi Tanabe, Hideki Matsune, Masahiro Kishida



Carbon nanotube (CNT)-supported Pd metal catalysts covered with silica layers show improved durability for oxygen reduction in polymer-electrolyte fuel cells.

Hydrodechlorination of chloromethanes with a highly stable Pt on activated carbon catalyst **pp 389–396**

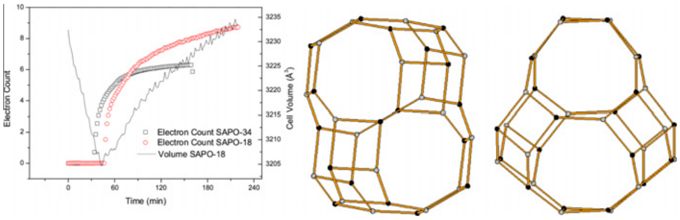
M.A. Álvarez-Montero, L.M. Gómez-Sainero*, A. Mayoral, I. Diaz, R.T. Baker, J.J. Rodriguez



Gas-phase hydrodechlorination of dichloromethane and chloroform to methane ($CH_xCl_y + yH_2 \rightarrow CH_{x+y} + yHCl$), with a prepared Pt/C catalyst, was studied. The catalyst showed a remarkable stability with no loss of activity after 26 days on stream. Re-dispersion of the Pt on the C support occurred upon HDC reaction.

Direct observation of catalyst behaviour under real working conditions with X-ray diffraction: Comparing SAPO-18 and SAPO-34 methanol to olefin catalysts **pp 397–402**

David S. Wragg*, Duncan Akporiaye, Helmer Fjellvåg



The closely related silicoaluminophosphate framework catalysts SAPO-18 and SAPO-34 are shown to behave very differently during the methanol to olefin conversion. SAPO-18 shows less expansion despite larger coke molecules being present.

ERRATUM

Erratum to “A highly dispersed Pd–Mg/SiO$_2$ catalyst active for methanation of CO$_2$” [J. Catal. 266 (2009) 92–97] **pp 403–404**

Jung-Nam Park, Eric W. McFarland*