

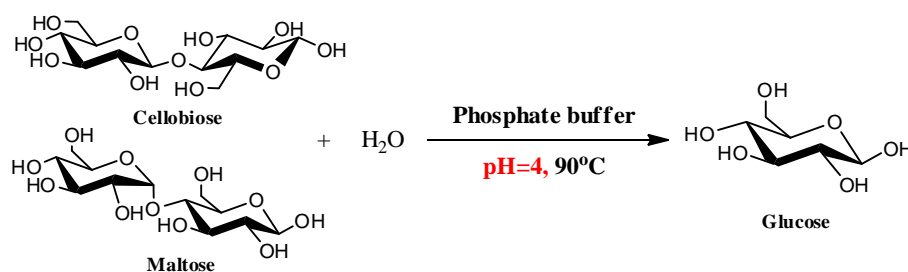


Contents

Unexpected phosphate salt-catalyzed hydrolysis of glycosidic bonds in model disaccharides: Cellobiose and maltose

pp 1–5

Alexandre Charmot, Alexander Katz*

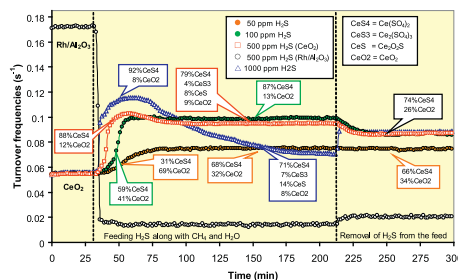


Glycosidic bond hydrolysis in both cellobiose and maltose proceeds under unexpectedly mild conditions when using simple phosphate salts as catalyst.

Role and advantages of H₂S in catalytic steam reforming over nanoscale CeO₂-based catalysts

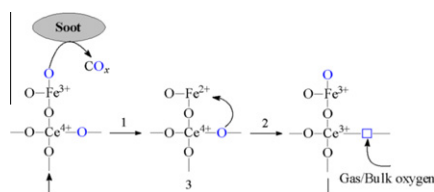
pp 6–15

N. Laosiripojana*, S. Charojrochkul, P. Kim-Lohsoontorn, S. Assabumrungrat

Unlike conventional metallic-based catalysts, the presence of poisonous H₂S gas (with appropriate content) increases the steam reforming rate of CeO₂-based catalysts, which is related to the formation of Ce(SO₄)₂ phase during the reaction.**Determination of active site densities and mechanisms for soot combustion with O₂ on Fe-doped CeO₂ mixed oxides**

pp 16–23

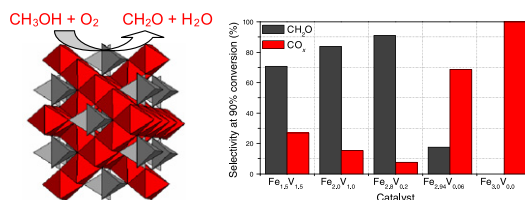
Zhaoliang Zhang*, Dong Han, Shaojie Wei, Yexin Zhang

The densities of active oxygen sites and turnover frequencies for soot combustion on Fe-doped CeO₂ mixed oxides are determined by isothermal anaerobic titrations with soot as the probe molecule.

Stability and performance of cation vacant $\text{Fe}_{3-x}\text{V}_x\text{O}_4$ spinel phase catalysts in methanol oxidation

pp 24–37

Robert Häggblad, Staffan Hansen, L. Reine Wallenberg, Arne Andersson*

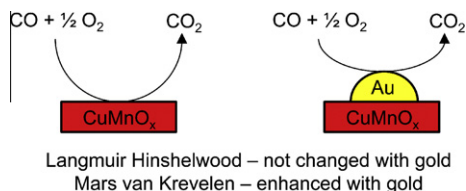


Cation vacant spinel phases with V-sites surrounded by Fe (V–O–Fe) are stable, active, selective and non-volatile in methanol oxidation to formaldehyde.

TAP studies of CO oxidation over CuMnO_x and Au/ CuMnO_x catalysts

pp 38–48

Kevin Morgan, Kieran J. Cole, Alexandre Goguet, Christopher Hardacre*, Graham J. Hutchings, Noleen Maguire, Sergiy O. Shekhtman, Stuart H. Taylor

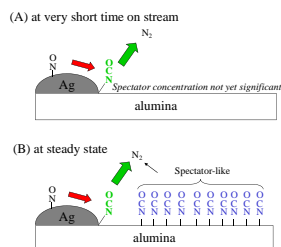


TAP studies of the CO oxidation reactions over CuMnO_x (Hopcalite) catalysts has revealed that the increased activity on doping with gold is due to promotion of the Mars van Krevelen mechanism with little change in the activity associated with the Langmuir-Hinshelwood mechanism.

Investigating the mechanism of the H_2 -assisted selective catalytic reduction (SCR) of NO_x with octane using fast cycling transient *in situ* DRIFTS-MS analysis

pp 49–55

Sarayute Chansai, Robbie Burch, Christopher Hardacre*, John Breen, Frederic Meunier

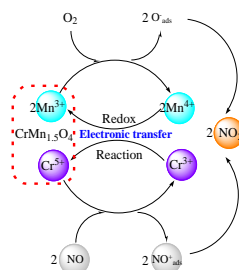


Examination of the H_2 -assisted Selective Catalytic Reduction of NO_x with octane over a $\text{Ag}/\text{Al}_2\text{O}_3$ catalyst using fast transient cycling switching of H_2 , monitored by DRIFTS and mass spectrometry, suggests that *some* of the isocyanate species could be important intermediates in this reaction.

Cr– MnO_x mixed-oxide catalysts for selective catalytic reduction of NO_x with NH_3 at low temperature

pp 56–65

Zhihang Chen, Qing Yang, Hua Li, Xuehui Li*, Lefu Wang, Shik Chi Tsang**

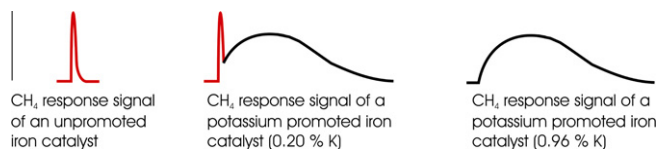


Impressive activity for low-temperature SCR of NO_x is achieved on novel catalysts containing $\text{CrMn}_{1.5}\text{O}_4$ phase, which provides catalytically active sites due to facilitated electron transfer between Cr and Mn.

The formation of methane over iron catalysts applied in Fischer–Tropsch synthesis: A transient and steady state kinetic study

pp 66–75

Barbara Graf, Hendrik Schulte, Martin Muhler*

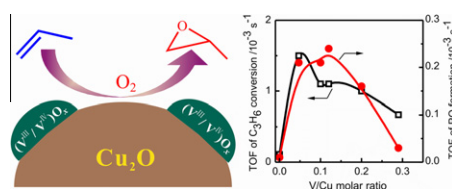


CH₄ formation over unpromoted and potassium-promoted iron catalysts applied in Fischer–Tropsch synthesis was studied via hydrogenation of CO during pulse experiments. The presence of potassium influences CH₄ formation by blocking the fast formation channel at least partially and establishing a new and slower reaction pathway.

Copper-catalyzed propylene epoxidation by oxygen: Significant promoting effect of vanadium on unsupported copper catalyst

pp 76–84

Lüjuan Yang, Jieli He, Qinghong Zhang, Ye Wang*

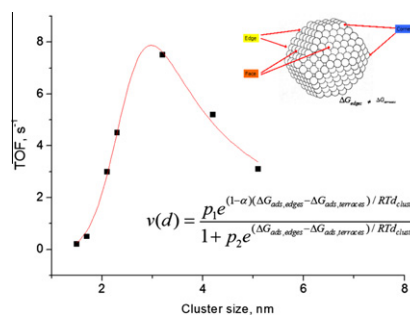


Modification of unsupported copper by vanadium significantly enhances its catalytic activity for propylene epoxidation. Cu^I with cooperation of vanadium species at lower valance states is responsible for propylene oxide formation.

Kinetic analysis of cluster size dependent activity and selectivity

pp 85–91

Dmitry Yu. Murzin

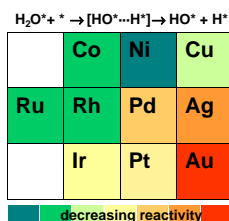


The impact of nanoparticle size effects in heterogeneous catalytic kinetics over supported metal catalysts is discussed taking into account different activities of edges and terraces.

Descriptors controlling the catalytic activity of metallic surfaces toward water splitting

pp 92–100

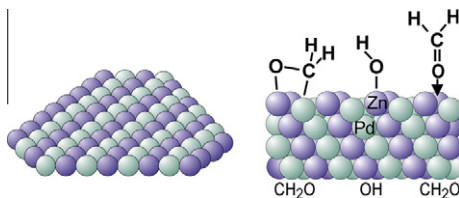
José L.C. Fajín, M. Natália D.S. Cordeiro, Francesc Illas*, José R.B. Gomes*



Water dissociation on regular, stepped and folded transition metal surfaces follows a BEP relationship. In addition, the adsorption energy of atomic oxygen on a given metallic surface provides an excellent descriptor of the activation energy thus allowing the screening of a large number of metallic and bimetallic systems in a simple way.

Steam reforming of methanol on PdZn near-surface alloys on Pd(1 1 1) and Pd foil studied by *in-situ* XPS, LEIS and PM-IRAS pp 101–113

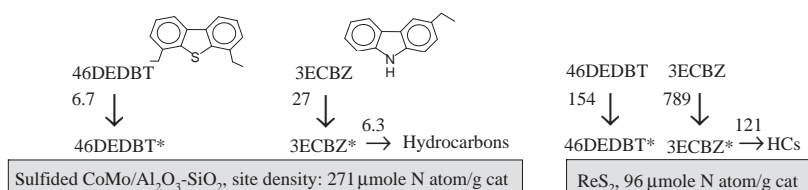
Christoph Rameshan, Christian Weilach, Werner Stadlmayr, Simon Penner, Harald Lorenz, Michael Hävecker, Raoul Blume, Tulio Rocha, Detre Teschner, Axel Knop-Gericke, Robert Schlögl, Dmitry Zemlyanov, Norbert Memmel, Günther Rupprechter, Bernhard Klötzer*



The bifunctional sites for methanol reforming on a multi- and monolayer Pd–Zn surface are structurally different, despite identical surface composition. The multilayer alloy activates water for reaction to CO₂ and H₂.

Kinetic characterization of unsupported ReS₂ as hydroprocessing catalyst pp 114–122

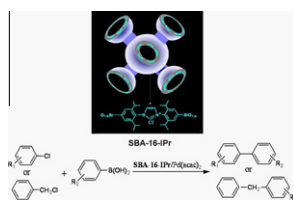
T.C. Ho*, Q. Shen, J.M. McConnachie, C.E. Kliewer



Shown here are adsorption constants for 4,6-diethylidibenzothiophene (46DEDBT) and 3-ethylcarbazole (3ECBZ) and hydrodenitrogenation rate constants on sulfided CoMo/Al₂O₃-SiO₂ and ReS₂. ReS₂ is more active for HDN; its HDS activity is less resilient to 3ECBZ inhibition.

Three-dimensional cubic mesoporous materials with a built-in N-heterocyclic carbene for Suzuki–Miyaura coupling of aryl chlorides and C(sp³)-chlorides pp 123–133

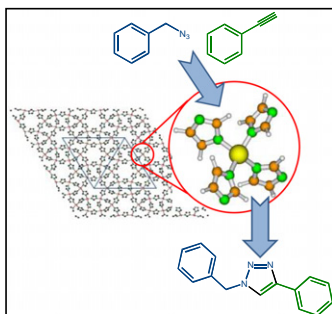
Hengquan Yang*, Guang Li, Zhancheng Ma, Jianbin Chao, Zhiqiang Guo



New mesoporous hybrid materials with a built-in N-heterocyclic carbene in the framework were synthesized. Such materials are active and recyclable for Suzuki–Miyaura coupling of challenging aryl/benzylic chlorides.

Bridging homogeneous and heterogeneous catalysis with MOFs: “Click” reactions with Cu-MOF catalysts pp 134–140

I. Luz, F.X. Lladrés i Xamena, A. Corma*

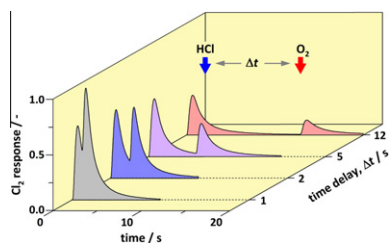


Copper-containing metal organic frameworks are highly active and fully regioselective heterogeneous “click” catalysts, with performances comparable to homogeneous Cu catalysts.

Transient mechanistic study of the gas-phase HCl oxidation to Cl₂ on bulk and supported RuO₂ catalysts

pp 141–151

Miguel A.G. Hevia, Amol P. Amrute, Timm Schmidt, Javier Pérez-Ramírez*

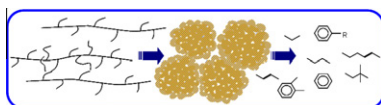


Temporal Analysis of Products (TAP) reactor studies improve the mechanistic understanding of the gas-phase HCl oxidation to Cl₂ (Deacon process) over RuO₂-based catalysts.

Catalytic properties in polyolefin cracking of hierarchical nanocrystalline HZSM-5 samples prepared according to different strategies

pp 152–160

D.P. Serrano, J. Aguado*, J.M. Escola, J.M. Rodriguez, A. Peral

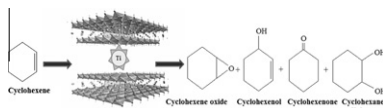


Hierarchical nanocrystalline ZSM-5 materials, prepared by a seed silanization method, showed a remarkable enhancement of the catalytic activity in the cracking of polyolefins compared to hierarchical ZSM-5 samples synthesized by a low-temperature procedure, the differences being especially pronounced for the case of waste polyethylene conversion.

A novel approach towards solvent-free epoxidation of cyclohexene by Ti(IV)–Schiff base complex-intercalated LDH using H₂O₂ as oxidant

pp 161–169

K.M. Parida*, Mitarani Sahoo, Sudarshan Singha

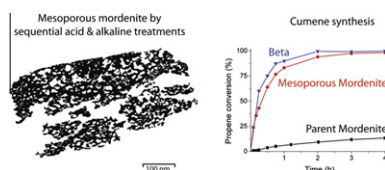


The solvent-free epoxidation reaction of cyclohexene using Ti–Schiff base complex-immobilized LDH will help experimentalist to achieve greener and most sustainable process.

Mesoporous mordenites obtained by sequential acid and alkaline treatments – Catalysts for cumene production with enhanced accessibility

pp 170–180

Adri N.C. van Laak, Sophia L. Sagala, Jovana Zečević, Heiner Friedrich, Petra E. de Jongh, Krijn P. de Jong*

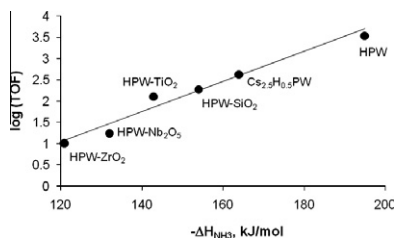


Commercially available mordenite was subjected to post-synthesis treatments. Sequential acid and alkaline treatments were found to be most effective to obtain mesoporous mordenite and visualized with electron tomography. Mesoporous mordenite was close in activity to zeolite beta for the production of cumene, with superior selectivity toward the undesired *n*-propylbenzene.

Solid acid catalysts based on $H_3PW_{12}O_{40}$ heteropoly acid: Acid and catalytic properties at a gas–solid interface

pp 181–189

Ali M. Alsalmeh, Paul V. Wiper, Yaroslav Z. Khimyak, Elena F. Kozhevnikova, Ivan V. Kozhevnikov*

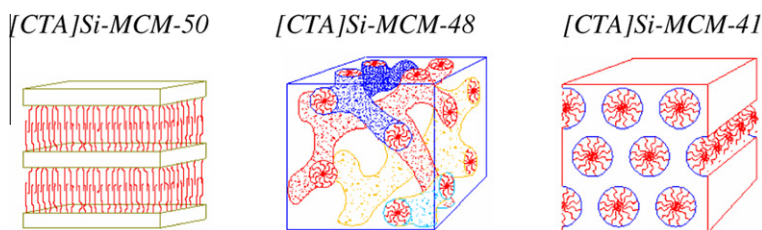


The strength of acid sites of supported $H_3PW_{12}O_{40}$ (HPW) catalysts (enthalpy of NH_3 adsorption) is weaker, and their catalytic activity in isopropanol dehydration (TOF) is lower than those of the standard unsupported catalysts (bulk HPW and $Cs_{2.5}H_{0.5}PW_{12}O_{40}$); they decrease in the order of supports: $SiO_2 > TiO_2 > Nb_2O_5 > ZrO_2$ (all catalysts calcined at 300 °C).

On the understanding of the remarkable activity of template-containing mesoporous molecular sieves in the transesterification of rapeseed oil with ethanol

pp 190–196

Demian Patrick Fabiano, Berna Hamad, Dilson Cardoso, Nadine Essayem*



Template-containing molecular sieves such as [CTA]Si-MCM-48 were shown to possess very weak basic sites by calorimetry, however the CO_2 adsorption isotherms are totally reversible. Their catalytic activities in transesterification are comparable to that of strong inorganic bases.