



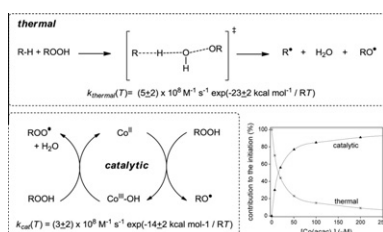
Contents

PRIORITY COMMUNICATION

Thermal and catalytic formation of radicals during autoxidation

pp 1–4

Ulrich Neuenschwander, Ive Hermans*



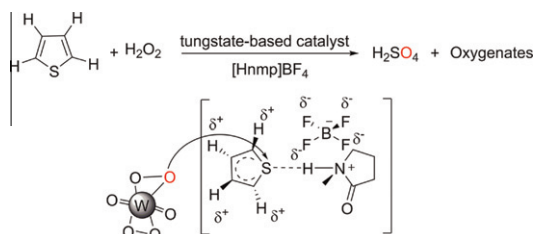
Quantitative insight was obtained in the formation of radicals during the autoxidation of the renewable olefin α -pinene, decoupling thermal and catalytic contributions to the chain-initiation.

REGULAR ARTICLES

Catalytic oxidation of thiophene and its derivatives via dual activation for ultra-deep desulfurization of fuels

pp 5–12

Boyuan Zhang, Zongxuan Jiang, Jun Li, Yongna Zhang, Feng Lin, Yan Liu*, Can Li*

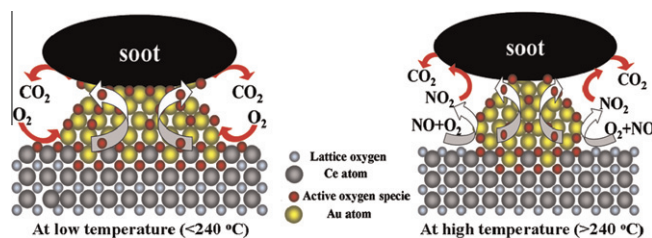


A catalytic system composed of ammonium tungstate and a Brønsted acidic ionic liquid (BAIL) [Hnmp]BF₄ was found to be highly active for the oxidative removal of thiophene, benzothiophene, and their derivatives from model oil using 30 wt.% aqueous H₂O₂ as the oxidant under mild condition.

The catalysts of three-dimensionally ordered macroporous Ce_{1-x}Zr_xO₂-supported gold nanoparticles for soot combustion: The metal-support interaction

pp 13–29

Yuechang Wei, Jian Liu, Zhen Zhao*, Aijun Duan, Guiyuan Jiang

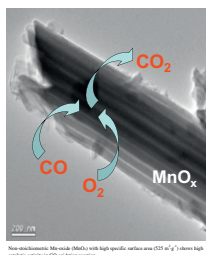


The catalytic activities of 3DOM Au/Ce_{1-x}Zr_xO₂ materials for soot oxidation are strongly related to the metal (Au)-supports (Ce) interaction. At low temperature, the soot particles are direct oxidized by active oxygen species migrated from the surface of supported Au catalysts. At high temperatures, the combined effects of active oxygen species and NO₂ enhance the rate of soot combustion.

Nanostructured MnO_x as highly active catalyst for CO oxidation

pp 30–36

Krisztina Frey*, Viacheslav Iablokov, György Sáfrán, János Osán, István Sajó, Rafal Szukiewicz, Sergey Chenakin, Norbert Kruse*

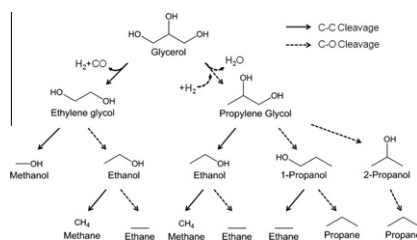


Non-stoichiometric Mn-oxide (MnO_x) with high specific surface area (525 m² g⁻¹) shows high catalytic activity in CO oxidation reaction.

Correlation of Pt-Re surface properties with reaction pathways for the aqueous-phase reforming of glycerol

pp 37–43

Liang Zhang, Ayman M. Karim, Mark H. Engelhard, Zhehao Wei, David L. King*, Yong Wang*

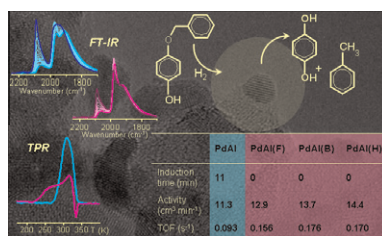


The major reaction pathways for aqueous-phase reforming of glycerol show the dependence of product selectivity on C–C bond cleavage (metal site-based) vs. C–O bond cleavage (acid site-based).

Effect of reduction in liquid phase on the properties and the catalytic activity of Pd/Al₂O₃ catalysts

pp 44–54

Elena Groppo*, Giovanni Agostini, Andrea Piovano, Naresh B. Muddada, Giuseppe Leofanti, Riccardo Pellegrini, Giuseppe Portale, Alessandro Longo, Carlo Lamberti

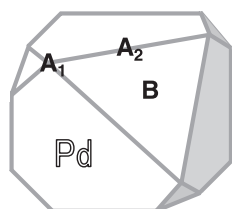


Relationships between the reduction state of a supported palladium catalyst, its surface structural properties, and its catalytic performance are investigated in a multi-technique approach.

Dynamics of direct H₂O₂ synthesis from H₂ and O₂ on a Pd nano-particle catalyst protected with polyvinylpyrrolidone

pp 55–61

Takashi Deguchi, Hitoshi Yamano, Masakazu Iwamoto*



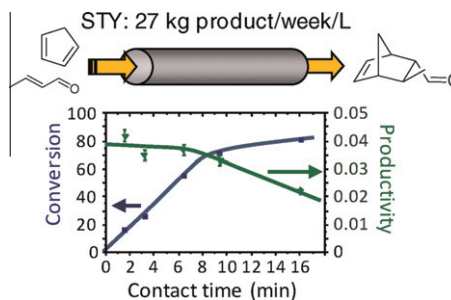
- A₁: Active for H₂O formation, inactivated by H⁺ and Br⁻ adsorption.
 A₂: Active for H₂O₂ formation, Langmuir-Hinshelwood mechanism.
Major sites on Pd-PVP catalyst.
 B : Active for H₂O₂ formation, first order on H₂ partial pressure.

Kinetics of the direct H₂O₂ synthesis from H₂ and O₂ and Br⁻ adsorption behaviors on a Pd–PVP colloid catalyst in water containing H⁺ and Br⁻ ions was quite different from those on a Pd/C catalyst, which proposed improved classification of Pd surface sites active for the H₂O₂ synthesis.

Alumina-grafted macro-/mesoporous silica monoliths as continuous flow microreactors for the Diels–Alder reaction

pp 62–67

A. Sachse, V. Hulea, A. Finiels, B. Coq, F. Fajula, A. Galarneau*

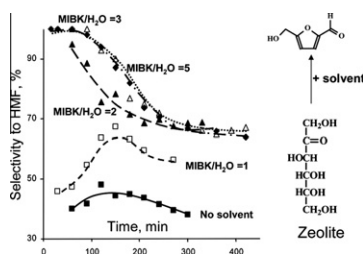


Aluminum oxide-grafted silica monoliths were proved as highly productive catalytic microreactors for the in-flow implementation of the Diels–Alder reaction. Control of contact time and monolithic length has allowed to overcome external diffusion limitations.

The effect of solvent addition on fructose dehydration to 5-hydroxymethylfurfural in biphasic system over zeolites

pp 68–75

V.V. Ordonsky, J. van der Schaaf, J.C. Schouten, T.A. Nijhuis*

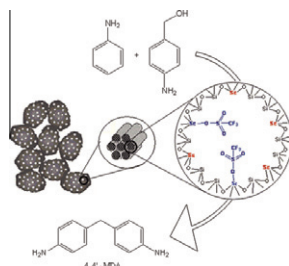


Solvent addition significantly improved the selectivity to HMF in the aqueous phase dehydration of fructose over zeolite catalysts. The solvent not only improves the selectivity by extraction of the HMF produced, but also changes the intrinsic activity of the catalyst.

Efficient Sc triflate mesoporous-based catalysts for the synthesis of 4,4'-methylenedianiline from aniline and 4-aminobenzylalcohol

pp 76–85

Natalia Candu, Madalina Ciobanu, Petru Filip, Jamal El Haskouri, Carmen Guillem, Pedro Amoros*, Daniel Beltran, Simona M. Coman*, Vasile I. Parvulescu*

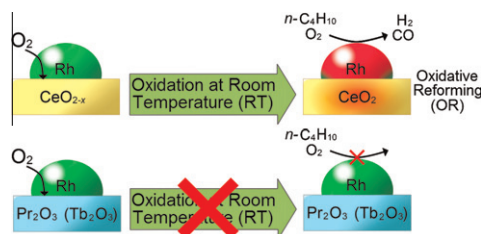


Isolated scandium triflate species incorporated in a UVM-7 porous bimodal support were prepared using a two-step strategy. These catalysts showed a high selectivity in the synthesis of 4,4'-methylenedianiline from aniline and 4-aminobenzylalcohol under mild conditions.

Effect of the nature of rhodium catalyst supports on initiation of H₂ production during *n*-butane oxidative reforming at room temperature

pp 86–92

Katsutoshi Nagaoka*, Katsutoshi Sato, Yusaku Takita

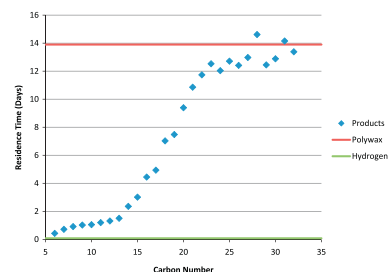


Oxidative reforming of *n*-butane was triggered rapidly at room temperature over Rh/CeO_{2-x} but not over Rh/Pr₂O₃ and Rh/Tb₂O₃. The unique ability of CeO_{2-x}, unlike Pr₂O₃ and Tb₂O₃, to be oxidized at room temperature played a crucial role in triggering oxidative reforming at room temperature.

Variation of residence time with chain length for products in a slurry-phase Fischer–Tropsch reactor

pp 93–101

Cornelius Mduduzi Masuku*, Wilson Davis Shafer, Wenping Ma, Muthu Kumaran Gnanamani, Gary Jacobs, Diane Hildebrandt, David Glasser, Burtrun H. Davis

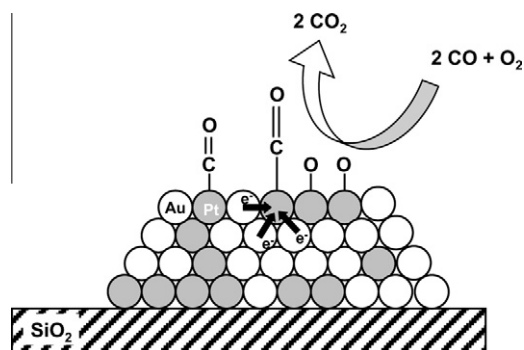


Residence time increase with carbon number up to C_{22} , the major removal method for products lighter than C_{10} is the gas phase while products between C_{10} and C_{22} are removed by both the vapor and the liquid flow. Products heavier than C_{22} have the same residence time as the polywax.

On the promoting effect of Au on CO oxidation kinetics of Au–Pt bimetallic nanoparticles supported on SiO_2 : An electronic effect?

pp 102–113

Rachel P. Doherty, Jean-Marc Krafft, Christophe Méthivier, Sandra Casale, Hynd Remita, Catherine Louis, Cyril Thomas*

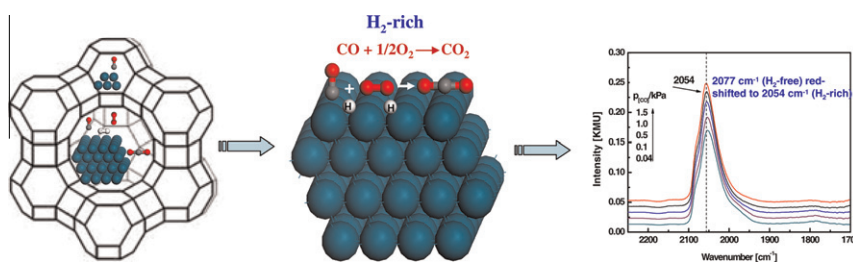


A promoting effect of Au is reported on the kinetics of CO oxidation over Pt on AuPt bimetallic nanoparticles supported on SiO_2 . This is attributed to a greater electron density of the Pt surface atoms due to charge transfer from Au to Pt, as indicated by XPS and CO-FTIR.

Mechanistic study of preferential CO oxidation on a Pt/NaY zeolite catalyst

pp 114–123

Jing Xu, Xin-Chao Xu, Like Ouyang, Xue-Jing Yang, Wei Mao, Junjie Su, Yi-Fan Han*

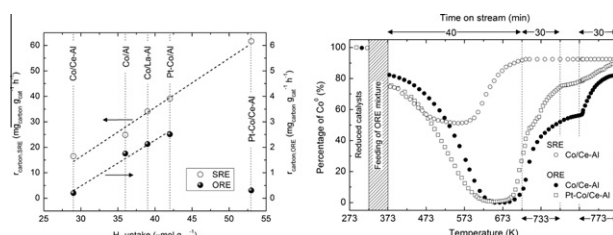


Mechanistic study of PROX of CO was carried out over a Pt(1.0 wt.%)/NaY zeolite catalyst from 300 to 523 K by combination of kinetics and spectroscopy. The activity of CO oxidation at 300 K was assumed to originate from Pt clusters less than 1.0 nm. In the presence of H_2 , a significant red-shift of the CO stretch frequency was observed in DRIFT spectra and CO oxidation was significantly enhanced.

Understanding the stability of Co-supported catalysts during ethanol reforming as addressed by *in situ* temperature and spatial resolved XAFS analysis

pp 124–137

C.N. Ávila-Neto, J.W.C. Liberatori, A.M. da Silva, D. Zanchet, C.E. Hori, F.B. Noronha, J.M.C. Bueno*

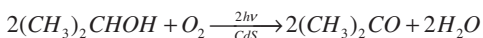
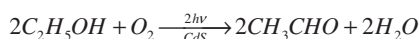
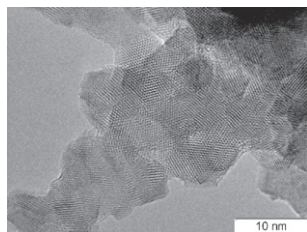


Temperature- and spatial resolved XANES indicated that the nature of supports and the composition of reactants determine the Co^{2+}/Co^0 ratio in reforming of ethanol, which control the activity and deposition of carbon.

Photocatalytic oxidation of ethanol and isopropanol vapors on cadmium sulfide

pp 138–148

Maxim A. Nasalevich, Ekaterina A. Kozlova, Tatyana P. Lyubina, Alexander V. Vorontsov*



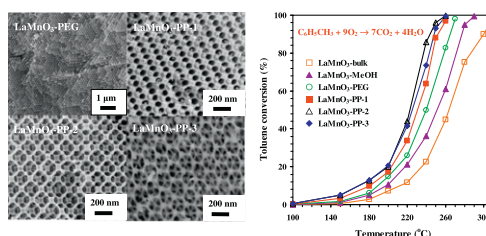
Nanosized cadmium sulfide photocatalyzes partial oxidation of alcohol vapors with oxygen of air at room temperature under visible light with quantum efficiency up to 6.6%.

Nanosized cadmium sulfide photocatalyzes partial oxidation of alcohol vapors with oxygen of air at room temperature under visible light with quantum efficiency up to 6.6%.

Controlled preparation and high catalytic performance of three-dimensionally ordered macroporous LaMnO₃ with nanovoid skeletons for the combustion of toluene

pp 149–160

Yuxi Liu, Hongxing Dai*, Yucheng Du, Jiguang Deng, Lei Zhang, Zhenxuan Zhao, Chak Tong Au

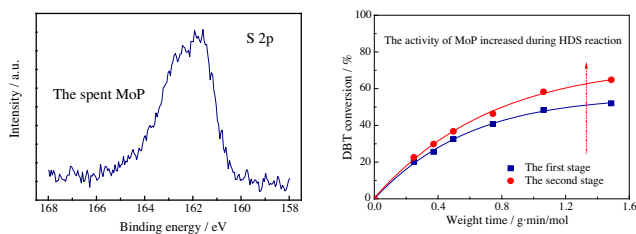


Through the surfactant-assisted PMMA-templating method, we prepared three-dimensionally ordered macroporous (3DOM) LaMnO₃ catalysts with nanovoid skeletons. It is found that the excellent performance of the catalysts in toluene combustion can be related to the high surface area and oxygen adspecies concentration as well as low-temperature reducibility of 3DOM LaMnO₃.

Hydrodesulfurization of dibenzothiophene and its hydrogenated intermediates over bulk MoP

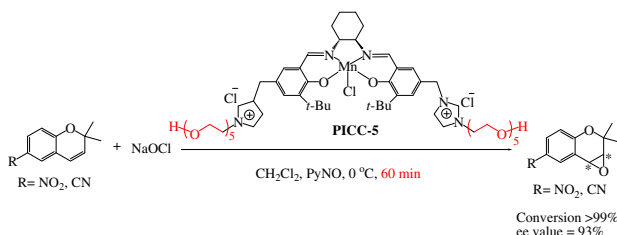
pp 161–169

Jin Bai, Xiang Li*, Anjie Wang, Roel Prins, Yao Wang

**Stable chiral salen Mn(III) complexes with built-in phase-transfer capability for the asymmetric epoxidation of unfunctionalized olefins using NaOCl as an oxidant**

pp 170–177

Rongchang Luo, Rong Tan*, Zhigang Peng, Weiguo Zheng, Yu Kong, Donghong Yin*

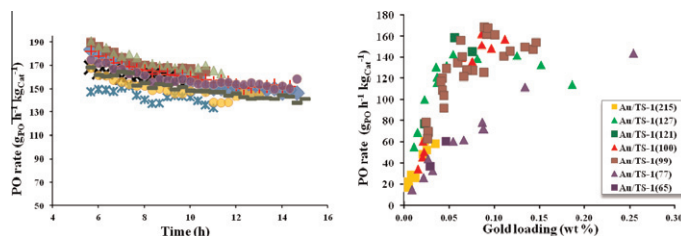


PEG chain-modified ionic liquid functionalized chiral salen Mn(III) complexes with built-in phase-transfer capability were first prepared and proved highly efficient in the asymmetric epoxidation of unfunctionalized olefins using aqueous NaOCl as an oxidant.

Reproducible preparation of Au/TS-1 with high reaction rate for gas phase epoxidation of propylene

pp 178–189

Wen-Sheng Lee, M. Cem Akatay, Eric A. Stach, Fabio H. Ribeiro, W. Nicholas Delgass*



The Au/TS-1 catalysts prepared at optimal DP conditions (pH of the gold slurry solution, the mixing time, and the preparation temperature) showed a PO rate $\sim 160 \text{ g}_{\text{PO}} \text{ h}^{-1} \text{ kg}_{\text{Cat}}^{-1}$, which is the highest PO rate at 200 °C yet reported. Instead of using TS-1 with high Ti content to increase the site density, diluted systems (low Au loading/low Ti loading) are recommended for preparing highly active Au/TS-1 for PO production.

Preferential oxidation of carbon monoxide in hydrogen using zinc oxide photocatalysts promoted and tuned by adsorbed copper ions

pp 190–202

Yusuke Yoshida, Yu Mitani, Takaomi Itoi, Yasuo Izumi*

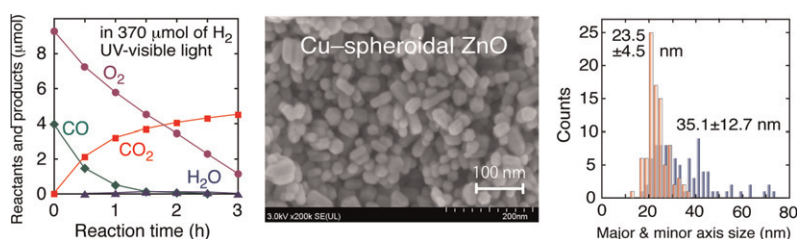
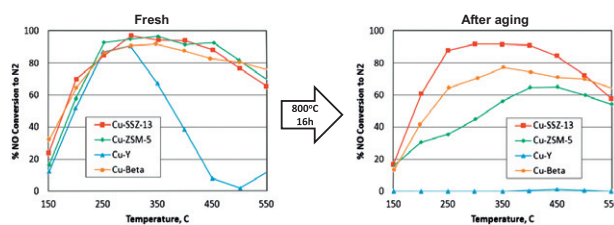


Photo-PROX: Preferential oxidation of CO in H₂ by photocatalysis using Cu(II) on spheroidal ZnO as the catalyst.

Effects of hydrothermal aging on NH₃-SCR reaction over Cu/zeolites

pp 203–209

Ja Hun Kwak*, Diana Tran, Sarah D. Burton, János Szanyi, Jong H. Lee*, Charles H.F. Peden*



After hydrothermal aging at 800 °C for 16 h, the NO_x reduction performance of Cu-ZSM-5, Cu-beta and Cu-Y were significantly reduced, while that of Cu-SSZ-13 was not affected.

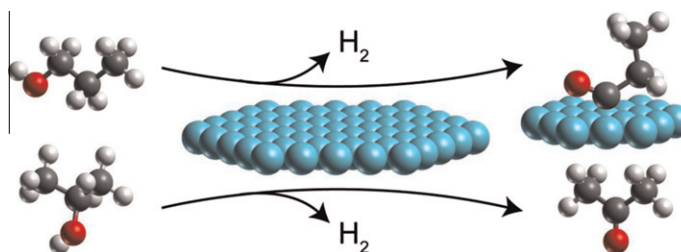
LETTER TO THE EDITOR

Comment on “Towards understanding the bifunctional hydrodeoxygenation and aqueous phase reforming of glycerol”

pp 210–213

[J. Catal. 269 (2010) 411–420]

Duygu Basaran, Alexander Genest, Notker Rösch



The experimentally observed dissimilar dehydrogenation behavior of 1- and 2- propanol on Pt surfaces is rationalized via DFT model calculations. The most stable dehydrogenation product of the primary alcohol, propionyl, strongly adsorbs whereas for the secondary alcohol, acetone is determined as product which desorbs easily.