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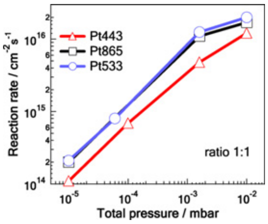
Contents

REGULAR ARTICLES

Structure sensitivity of ammonia oxidation over platinum pp 129–136

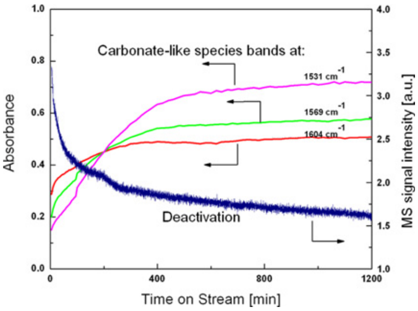
Ying Feng Zeng, Ronald Imbihl*



Ammonia oxidation over different Pt single crystal orientations and a Pt foil has been studied in the 10^{-5} to 10^{-2} mbar range using rate measurements and LEED. The reaction exhibits only a moderate structure sensitivity as shown in the plot which depicts how the maximum rate of N_2 production depends on the total pressure for the orientations Pt(533), Pt(443), and Pt(865). A mixing ratio of ammonia to oxygen of 1:1 was chosen.

CO oxidation catalyzed by gold supported on MgO: Spectroscopic identification of carbonate-like species bonded to gold during catalyst deactivation pp 137–149

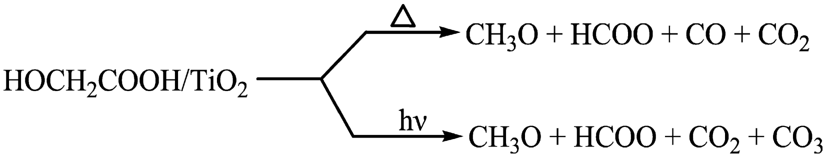
Y. Hao, M. Mihaylov, E. Ivanova, K. Hadjiivanov, H. Knözinger, B.C. Gates*



Accumulation of carbonate-like species on gold led to the deactivation of MgO-supported gold catalysts for CO oxidation reaction.

Decomposition pathways of glycolic acid on titanium dioxide pp 150–157

Chia-Hsun Ho, Chun-Yi Shieh, Chien-Lin Tseng, Yi-Kwan Chen, Jong-Liang Lin*

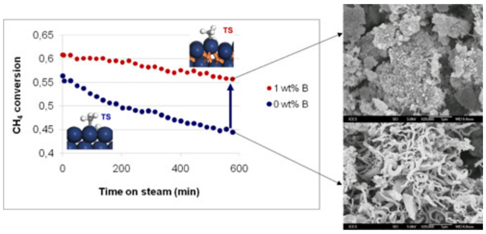


Decomposition pathways of glycolic acid on a TiO_2 surface. In this paper, the adsorption, thermal reactions and photodegradation of glycolic acid on TiO_2 are investigated in a gas–solid interaction system with Fourier-transformed infrared spectroscopy.

Effect of boron on the stability of Ni catalysts during steam methane reforming

pp 158–165

Jing Xu, Luwei Chen, Kong Fei Tan, Armando Borgna*, Mark Saeys*

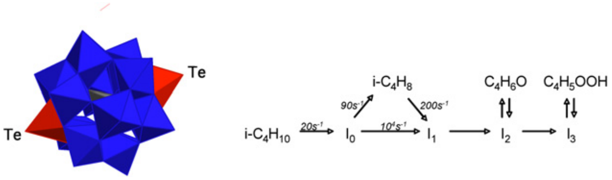


Promotion of a 15 wt% Ni/γ-Al_2O_3 catalyst with 1.0 wt% B reduces deactivation by carbon deposition 3-fold and increases the initial methane conversion.

Study of Te and V as counter-cations in Keggin type phosphomolybdic polyoxometalate catalysts for isobutane oxidation

pp 166–176

Q. Huynh, Y. Schuurman, P. Delichere, S. Loridant, J.M.M. Millet*

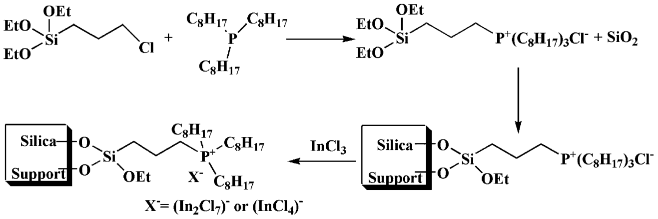


Keggin-type phosphomolybdic acid and cesium salts with protons partially substituted by Te and vanadyl cations are shown to be stable and efficient catalysts in the partial oxidation of isobutane. These cations, which are capping the anions, induce respectively a positive effect on the selectivity to methacrylic acid and the activity. A reaction mechanism with several intermediates is proposed from the catalytic data obtained.

Phenol alkylation with isobutene — influence of heterogeneous Lewis and/or Brønsted acid sites

pp 177–187

Elena Modrogan, Michael H. Valkenberg, Wolfgang F. Hoelderich*

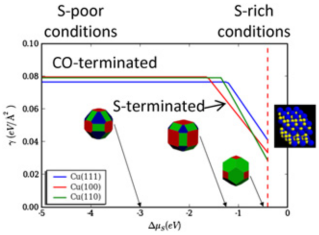


Acidic solid catalysts with different types of acidity were used to study the liquid-phase alkylation of phenol with isobutene. A phosphonium ionic liquid immobilized on silica type carrier exhibiting pure Lewis acidity, Amberlyst 15 with pure Brønsted acidity as well as WO_3/ZrO_2 with both type of acid sites were used for this study. The active sites are postulated based on pyridine-FT-IR and NH_3-TPD studies, BET analyses, MAS NMR and XRD measurements. The different properties of the chosen catalysts are mirrored in the product distribution of the reaction mixture. It was found that WO_3/ZrO_2 is a very active and selective catalyst for the production of 2,4-di-*tert*-butylphenol under mild reaction conditions.

Atomistic thermodynamics study of the adsorption and the effects of water–gas shift reactants on Cu catalysts under reaction conditions

pp 188–194

Nilay İnoğlu, John R. Kitchin*

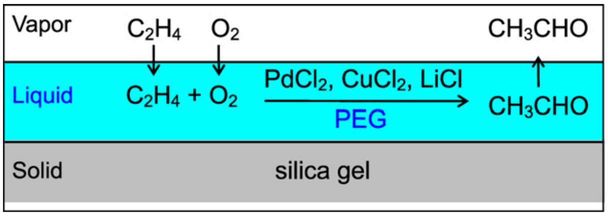


Catalyst morphologies and adsorbate coverages depend sensitively on the reactive environment conditions such as pressure and temperature. As a result, the distribution of active sites may be environment-dependent.

Wacker-type oxidation in vapor phase using a palladium–copper chloride catalyst in a liquid polymer medium supported on silica gel

pp 195–200

Masaki Okamoto*, Yuichi Taniguchi

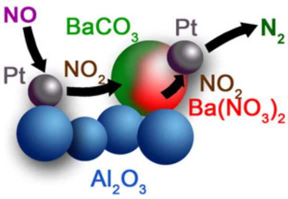


A $PdCl_2$–$CuCl_2$–LiCl catalyst in a polyethylene glycol medium supported on silica gel was highly active and stable for vapor-phase synthesis of acetaldehyde by Wacker-type oxidation of ethylene.

Influence of Pt location on $BaCO_3$ or Al_2O_3 during NO_x storage reduction

pp 201–207

Robert Büchel, Reto Strobel, Frank Krumeich, Alfons Baiker, Sotiris E. Pratsinis*

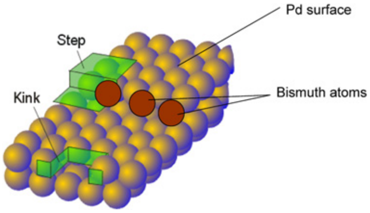


Pt clusters were slectively deposited on the Ba- and/or Al-components of $Pt/Ba/Al_2O_3$ catalysts without altering any other physical property of the catalyst. When Pt was in close proximity to Al, high NO_x storage activity was observed but regeneration was better when Pt was in close proximity to Ba. Good catalyst regeneration was essential for high NO_x conversion.

Pd catalysed hexyne hydrogenation modified by Bi and by Pb

pp 208–216

James A. Anderson*, Jane Mellor, Richard P.K. Wells

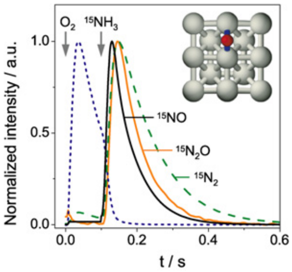


Bismuth atoms preferentially occupying step sites on a Pd surface, forcing reaction onto the open terrace sites and modifying selectivity in hydrogenation reactions.

Mechanism of ammonia oxidation over PGM (Pt, Pd, Rh) wires by temporal analysis of products and density functional theory

pp 217–223

Javier Pérez-Ramírez*, Evgenii V. Kondratenko*, Gerard Novell-Leruth, Josep M. Ricart

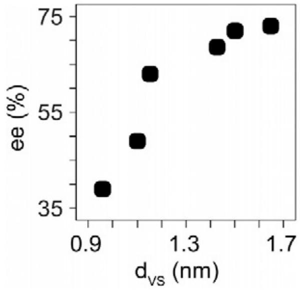


The mechanism of the high-temperature ammonia oxidation over Pt, Pd, and Rh wires is studied by temporal analysis of products and complemented by density functional theory simulations. Selectivity governing factors towards NO, N_2O, and N_2 on the PGMs are emphasized.

Remarkable particle size effect in Rh-catalyzed enantioselective hydrogenations

pp 224–231

Fatos Hoxha, Niels van Vegten, Atsushi Urakawa, Frank Krumeich, Tamas Mallat, Alfons Baiker *

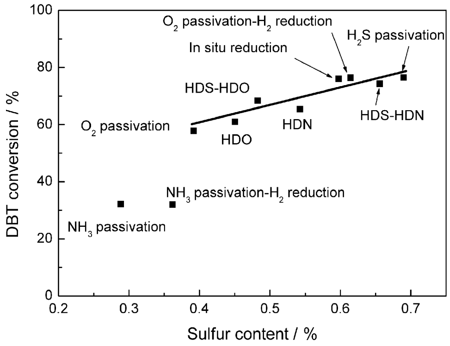


Flame made Rh/Al_2O_3 is highly selective in the hydrogenation of α-ketoesters, but decreasing the Rh particle size (Rh loading) leads to a drop in enantioselectivity; the origin of the phenomenon is discussed.

Role of sulfur in hydrotreating catalysis over nickel phosphide

pp 232–240

Xinping Duan, Yang Teng, Anjie Wang*, Victor M. Kogan, Xiang Li, Yao Wang



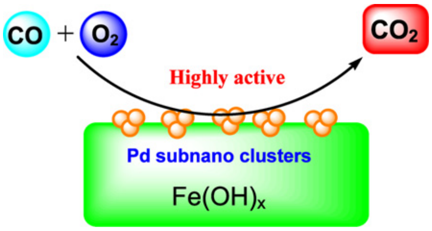
A correlation of the HDS performance with the sulfur content of the spent Ni_2P/MCM-41 catalyst after HDS reaction was established: The catalyst with high sulfur content after HDS showed high HDS performance.

RESEARCH NOTE

Preparation of highly effective ferric hydroxide supported noble metal catalysts for CO oxidations: From gold to palladium

pp 241–244

Botao Qiao, Lequan Liu, Juan Zhang, Youquan Deng*



Ferric hydroxide supported Pd catalyst prepared by a simple co-precipitation method without calcinations at elevated temperatures and only reduced at 50 °C possessed unexpectedly higher activity for CO oxidations even compared with that of supported Au catalysts.