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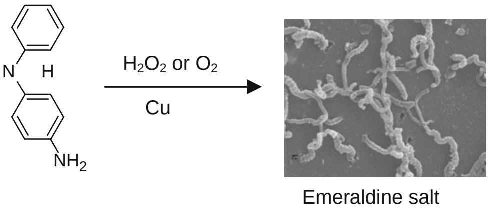
# Journal of Catalysis Vol. 267, Issue 2, 2009

# Contents

## REGULAR ARTICLES

**A green route to conducting polyaniline by copper catalysis** **pp 93–96**

Zhi Chen, Cristina Della Pina, Ermelinda Falletta, Michele Rossi *



Simple copper catalysts allow the facile synthesis of conducting polyaniline which is, however, inhibited by acetonitrile.

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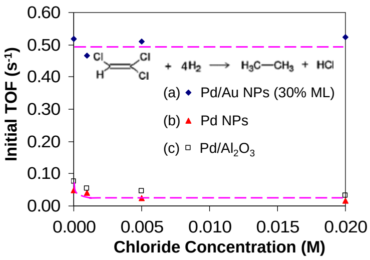
**Deactivation resistance of Pd/Au nanoparticle catalysts for water-phase hydrodechlorination** **pp 97–104**

Kimberly N. Heck, Michael O. Nutt, Pedro Alvarez, Michael S. Wong *



The effects of chloride and sulfide on water-phase trichloroethene hydrodechlorination using Pd-on-Au nanoparticles (Pd/Au NPs), Pd NPs, and alumina-supported Pd were studied. Pd/Au NPs were resistant to chloride poisoning unlike monometallic Pd, and they showed greater resistance to sulfide poisoning than monometallic Pd. Lower Pd content surface coverages led to less activity but resistance to sulfide poisoning.

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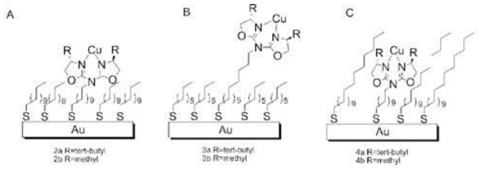
**Immobilized aza-bis(oxazoline) copper catalysts on SAMs: Selectivity dependence on catalytic site embedding** **pp 105–113**

Christy C. Paluti, Ellen S. Gawalt *

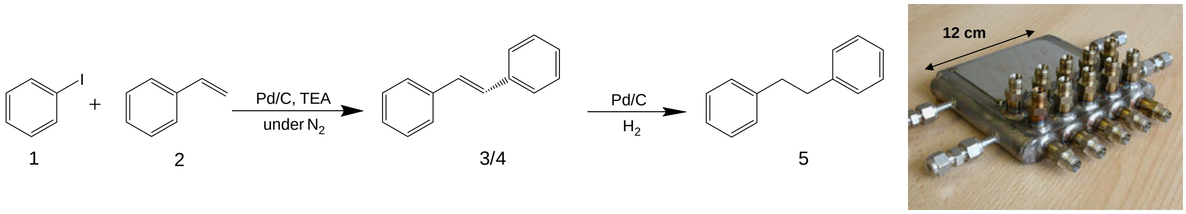


(A) The catalyst is even with the monolayer surface (B) the catalyst is above the monolayer surface
(C) the catalyst is below the monolayer surface

Aza-bis(oxazoline) copper complexes have been immobilized onto alkanethiol self-assembled monolayer with three different surface orientations and tested in the benchmark cyclopropanation reaction of ethyl diazoacetate and styrene.

## Coupling of Heck and hydrogenation reactions in a continuous compact reactor **pp 114–120**

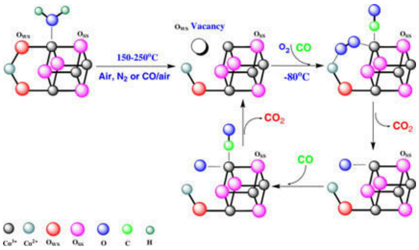
Xiaolei Fan, Maria Gonzalez Manchon, Karen Wilson, Steve Tennison, Alexander Kozynchenko, Alexei A. Lapkin, Pawel K. Plucinski *



A continuous multi-step synthesis of 1,2-diphenylethane *via* a Heck C–C coupling reaction with subsequential hydrogenation of intermediate product was performed in a structured multichannel compact reactor packed with carbon-supported Pd catalysts. Due to the integration of the micro-heat exchanger, the static mixer and the mesoscale packed-bed reaction channel, the compact reactor was proven to be an excellent tool for this multi-step synthesis.

## Pretreatments of $Co_3O_4$ at moderate temperature for CO oxidation at −80 °C **pp 121–128**

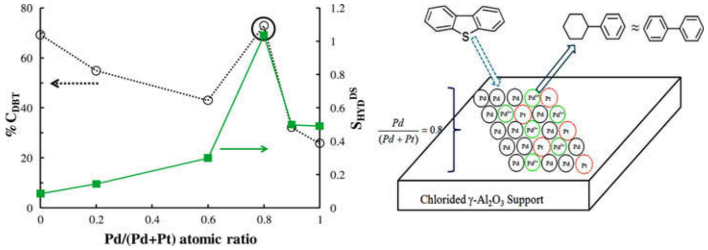
Yunbo Yu, Takashi Takei, Hironori Ohashi, Hong He, Xiuli Zhang, Masatake Haruta *



Among base metal oxides, $Co_3O_4$, $MnO_2$, and NiO were found to be intrinsically very active for CO oxidation, because $Co_3O_4$ calcined at 300 °C, for example, could achieve 100% conversion even below −80 °C when pretreated in a stream of non-reducing dry gas between 150 and 250 °C. It was proved that pretreatment in non-reducing dry atmosphere, particularly in $N_2$ and CO/air, at moderate temperatures enhanced the formation of surface oxygen vacancies, where weakly bound molecular oxygen species were formed to react with CO adsorbed on $Co^{3+}$ site. This finding provides a novel guideline for the creation of base metal oxide catalysts with high activity at low temperatures.

## Development of the HYD route of hydrodesulfurization of dibenzothiophenes over Pd–Pt/γ-$Al_2O_3$ catalysts **pp 129–139**

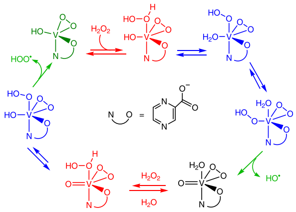
V.G. Baldovino-Medrano, P. Eloy, E.M. Gaigneaux, Sonia A. Giraldo, Aristóbulo Centeno *



The development of the hydrogenation route of hydrodesulfurization of dibenzothiophene over Pd–Pt/γ-$Al_2O_3$ catalysts was studied. A synergetic effect for HYD was demonstrated to exist which is in correspondence with that observed in the hydrogenation of aromatic molecules under $H_2S$ atmospheres. It is demonstrated that selectivity to HYD is a function of the Pd/(Pd + Pt) atomic ratio and that the presence of $Pd^{\delta+}$ surface species in the Pd–Pt system is crucial for the development of HYD.

## Mechanism of oxidations with $H_2O_2$ catalyzed by vanadate anion or oxovanadium(V) triethanolaminate (vanadatrane) in combination with pyrazine-2-carboxylic acid (PCA): Kinetic and DFT studies **pp 140–157**

Marina V. Kirillova, Maxim L. Kuznetsov, Vladimir B. Romakh, Lidia S. Shul'pina, João J.R. Fraústo da Silva, Armando J.L. Pombeiro *, Georgiy B. Shul'pin *



Spectroscopic, kinetic, and DFT mechanistic studies of isopropanol oxidation (with $H_2O_2$) to acetone and of cyclohexane to cyclohexyl hydroperoxide, catalyzed by oxovanadium(V) species, in the presence of PCA, disclose details of free radical generation and an important role of water.

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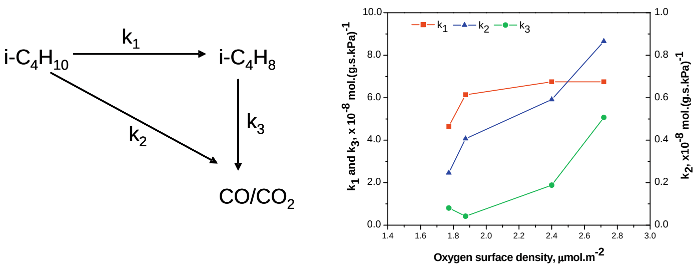
### Investigation of the selective sites on graphitic carbons for oxidative dehydrogenation of isobutane **pp 158–166**

Hong Xie, Zili Wu, Steven H. Overbury, Chengdu Liang *, Viviane Schwartz *



The selective sites for the ODH of isobutene were probed by carbon model catalysts. A parallel-consecutive reaction pathway was identified. The quinone-type sites have no correlation with the isobutene selectivity.

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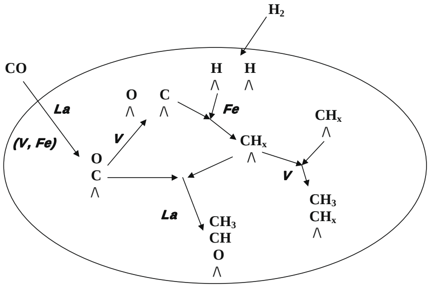
### La, V, and Fe promotion of Rh/$SiO_2$ for CO hydrogenation: Effect on adsorption and reaction **pp 167–176**

Xunhua Mo, Jia Gao, Nattawan Umnajkaseam, James G. Goodwin Jr. *



In this work, the effect of Fe on Rh–La–V/$SiO_2$ was examined and the role of each individual promoter scrutinized with regard to its effect on CO hydrogenation.

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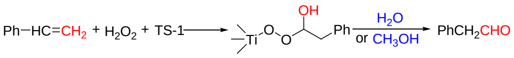
### *In-situ* $^{13}C$ MAS NMR investigation of solvent effect on the formation of phenylacetaldehyde over TS-1 zeolite **pp 177–180**

Jianqin Zhuang *, Xiuwen Han, Xinhe Bao*, Ulrich Mueller



*In-situ* $^{13}C$ MAS NMR experiments presented that protic solvents such as water and methanol provide acidic centers during the reaction, which is a unique factor to form phenylacetaldehyde over TS-1 zeolite.

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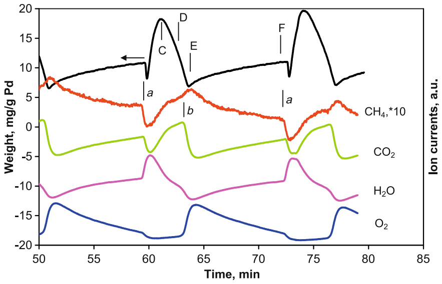
### The study of the oscillatory behavior during methane oxidation over Pd catalysts **pp 181–187**

V.Yu. Bychkov *, Yu.P. Tyulenin, M.M. Slinko, D.P. Shashkin, V.N. Korchak

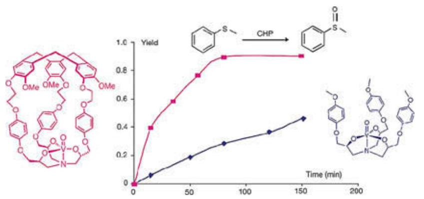


Significant variation of carbon and oxygen content in Pd catalysts during the oscillatory methane oxidation was observed. Four states of Pd with different activities were revealed.

### Hemicryptophane–oxidovanadium(V) complexes: Lead of a new class of efficient supramolecular catalysts

**pp 188–192**

Alexandre Martinez, Jean-Pierre Dutasta *



Hemicryptophane–oxidovanadium(V) complexes represent a new class of efficient supramolecular catalysts and show much higher catalytic performance in oxidation of sulfides in comparison with the model compound that lacks a molecular cavity.

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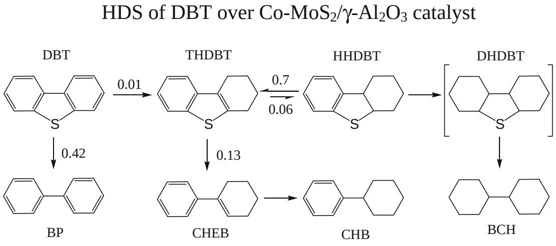
### Mechanistic studies and kinetics of the hydrodesulfurization of dibenzothiophene on Co–$MoS_2$/γ–$Al_2O_3$

**pp 193–201**

Yinyong Sun, Roel Prins *



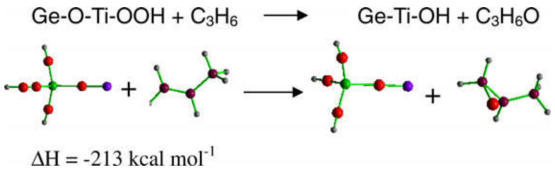
The desulfurization of DBT over Co–$MoS_2$/γ–$Al_2O_3$ is faster than that of tetrahydro-DBT and hexahydro-DBT. Desulfurization of DBT and tetrahydro-DBT occurs directly by hydrogenolysis, while hexahydro-DBT mainly desulfurizes indirectly by first dehydrogenation to tetrahydro-DBT.

## RESEARCH NOTE

### Enhanced reactivity of direct propylene epoxidation with $H_2$ and $O_2$ over Ge-modified Au/TS-1 catalysts

**pp 202–206**

Tong Liu, Pelin Hacarlioglu, S. Ted Oyama *, Meng-Fei Luo, Xiao-Rong Pan, Ji-Qing Lu*



Gold supported on a Ge-modified TS-1 was active for propylene epoxidation, due to a ligand effect of Ge on Ti, which lowered the activation energy for the critical epoxidation step.