### **AIMS AND SCOPE**

While total synthesis reached extraordinary levels of sophistication in the last century, the development of practical and efficient synthetic methodologies is still in its infancy. The goal of achieving chemical reactions that are economical, safe, environmentally benign, resource- and energy-saving will demand the highest level of scientific creativity, insight and understanding in a combined effort by academic and industrial chemists.

Advanced Synthesis & Catalysis is designed to stimulate and advance that process by focusing on the development and application of efficient synthetic methodologies and strategies in organic, bioorganic, pharmaceutical, natural product, macromolecular and materials chemistry. The targets of synthetic studies can range from natural products and pharmaceuticals to macromolecules and organic materials. While catalytic methods based on metal complexes or enzymes play an ever increasing role in achieving synthetic efficiency, all areas of interest to the practical synthetic chemist fall within the purview of Advanced Synthesis & Catalysis, including synthesis design, reaction techniques, separation science and process development.

Contributions from industrial and governmental laboratories are highly encouraged. It is the goal of the journal to help initiate a new era of chemical science, based on the efforts of synthetic chemists and on interdisciplinary collaboration, so that chemistry will make an even greater contribution to the quality of life than it does now.



succeeding Journal für praktische Chemie (founded in 1828)

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**2004**, *346*, 2+3, **Pages 93–376** 

Issue 1/2004 was published online on February 16, 2004

### **COMMENTARIES**

The Current Status and Future Trends in Oxidation Chemistry

Adv. Synth. Catal. 2004, 346, 107-108

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Oxidation Catalysis: Bringing Together the Interests of Academic and Industrial Researchers

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### **REVIEWS**

Hypervalent Iodine Reagents for the Oxidation of Alcohols and Their Application to Complex Molecule Synthesis

Adv. Synth. Catal. 2004, 346, 111-124

Hirofumi Tohma, Yasuyuki Kita\*

125 Biocatalytic Oxidation of Primary and Secondary Alcohols

Adv. Synth. Catal. 2004, 346, 125-142

Wolfgang Kroutil\*, Harald Mang, Klaus Edegger, Kurt Faber

$$\begin{array}{c|c} OH & \hline & Enzyme/Microorganism & O \\ \hline & -[H_2] & R' & H \end{array}$$

**143** α-Hydroxylation of β-Dicarbonyl Compounds

Adv. Synth. Catal. 2004, 346, 143-151

Jens Christoffers,\* Angelika Baro, Thomas Werner

152 Solid Materials as Sources for Synthetically Useful Singlet Oxygen

Adv. Synth. Catal. 2004, 346, 152-164

Joos Wahlen, Dirk E. De Vos,\* Pierre A. Jacobs, Paul L. Alsters

$$O_2$$
 photocatalyst  $O_2$   $O_2$   $O_2$   $O_2$   $O_2$   $O_2$   $O_2$   $O_3$   $O_4$   $O_2$   $O_2$   $O_3$   $O_4$   $O_2$   $O_3$   $O_4$   $O_5$   $O_5$   $O_5$ 

165 Oxidations Catalyzed by Metallocorroles

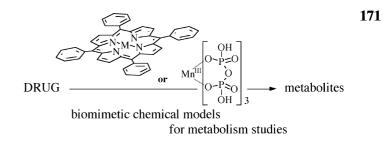
Adv. Synth. Catal. 2004, 346, 165-170

Zeev Gross\* Harry B. Gray\*

Biomimetic Chemical Catalysts in the Oxidative Activation of Drugs

Adv. Synth. Catal. 2004, 346, 171-184

Jean Bernadou\*, Bernard Meunier

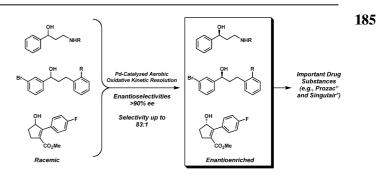


### COMMUNICATIONS

The Resolution of Important Pharmaceutical Building Blocks by Palladium-Catalyzed Aerobic Oxidation of Secondary Alcohols

Adv. Synth. Catal. 2004, 346, 185-189

Daniel D. Caspi, David C. Ebner, Jeffrey T. Bagdanoff, Brian M. Stoltz\*



In situ Formation of Peracetic Acid in Iron-Catalyzed Epoxidations by Hydrogen Peroxide in the Presence of Acetic Acid

Adv. Synth. Catal. 2004, 346, 190-194

Megumi Fujita, Lawrence Que, Jr.\*

$$H_2O_2$$
 $Fe$ 
 $AcOH$ 
 $Fe$ 
 $AcOH$ 
 $Fe$ 
 $AcOH$ 
 $Fe$ 
 $AcOH$ 
 $Fe$ 
 $Fe$ 
 $Fe$ 
 $Fe$ 

[Fe] : [Fe(N4)] catalyst

Catalytic Enantioselective Oxidation of Alkanes and Alkenes Using (Salen)Manganese Complexes Bearing a Chiral Binaphthyl Strapping Unit

Adv. Synth. Catal. 2004, 346, 195-198

Shun-Ichi Murahashi,\* Satoru Noji, Naruyoshi Komiya

Synthesis of Naphthalenediols by Aerobic Oxidation of Diisopropylnaphthalenes Catalyzed by N-Hydroxyphthalimide (NHPI)/ $\alpha$ , $\alpha'$ -Azobisisobutyronitrile (AIBN)

Adv. Synth. Catal. 2004, 346, 199-202

Yasuhiro Aoki, Satoshi Sakaguchi, Yasutaka Ishii\*

Adv. Synth. Catal. 2004, 346, 95-102

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Air 20 atm

190

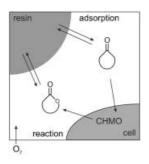
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## FULL PAPERS

203 Microbial Transformations, 56. Preparative Scale Asymmetric Baeyer–Villiger Oxidation using a Highly Productive "Two-in-One" Resin-Based *in situ* SFPR Concept

Adv. Synth. Catal. 2004, 346, 203-214

Iris Hilker, Véronique Alphand, Roland Wohlgemuth, Roland Furstoss\*



215 Application of High Throughput Screening to Heterogeneous Liquid and Gas Phase Oxidation Catalysis

Adv. Synth. Catal. 2004, 346, 215-230

Anil Guram, Alfred Hagemeyer,\* Claus G. Lugmair, Howard W. Turner, Anthony F. Volpe Jr, W. Henry Weinberg, Karin Yaccato

Ar-CH<sub>2</sub>-OH + 0.5 O<sub>2</sub> 
$$\xrightarrow{V/C}$$
 Ar-CHO + H<sub>2</sub>O  $\xrightarrow{NdSrMnPdO_x}$  CO<sub>2</sub> + NO + H<sub>2</sub>O  $\xrightarrow{Porovskites}$  CO<sub>2</sub> + NO + H<sub>2</sub>O  $\xrightarrow{CoCrO_x}$  4 CO<sub>2</sub> + 5 H<sub>2</sub>O  $\xrightarrow{Color_3-CH_2-CH_3}$  + NH<sub>3</sub> + 2 O<sub>2</sub>  $\xrightarrow{MoVNbTeO_x}$  CH<sub>2</sub>=CH-CN + 4 H<sub>2</sub>O

**231** Fluorinated Silica Gels Doped with TPAP as Effective Aerobic Oxidation Catalysts in Dense Phase Carbon Dioxide

Adv. Synth. Catal. 2004, 346, 231-236

Rosaria Ciriminna, Sandro Campestrini, Mario Pagliaro\*

**237** Aerobic Oxidation of 1-Phenylethanol Catalyzed by Palladaheterocycles

Adv. Synth. Catal. 2004, 346, 237-244

Sari Paavola, Krister Zetterberg,\* Timofei Privalov, Ingeborg Csöregh, Christina Moberg\*

245 Photooxygenation in Polystyrene Beads with Covalently and Non-Covalently Bound Tetraarylporphyrin Sensitizers

Adv. Synth. Catal. 2004, 346, 245-251

Axel G. Griesbeck,\* Tamer T. El-Idreesy, Anna Bartoschek

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IBX-Mediated Conversion of Primary Alcohols and Aldehydes to *N*-Hydroxysuccinimide Esters

Adv. Synth. Catal. 2004, 346, 252-256

Agnes Schulze, Athanassios Giannis\*

A New Environmentally Benign Catalytic Process for the Asymmetric Synthesis of Lactones: Synthesis of the Flavouring  $\delta\text{-Decalactone}$  Molecule

Adv. Synth. Catal. 2004, 346, 257-262

Avelino Corma\*, Sara Iborra, María Mifsud, Michael Renz, Manuel Susarte

Ruthenium-Catalyzed Asymmetric Alkene Epoxidation with *tert*-Butyl Hydroperoxide as Oxidant

Adv. Synth. Catal. 2004, 346, 263-267

Santosh Bhor, Man Kin Tse, Markus Klawonn, Christian Döbler, Wolfgang Mägerlein, Matthias Beller\*

Liquid Phase Oxidation of Alkenes with Nitrous Oxide to Carbonyl Compounds

Adv. Synth. Catal. 2004, 346, 268-274

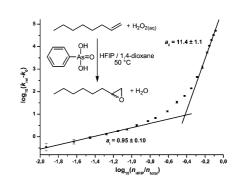
E. V. Starokon, K. A. Dubkov, D. E. Babushkin, V. N. Parmon, G. I. Panov\*

R - H, Alk, etc.

Kinetic Studies of Olefin Epoxidation with Hydrogen Peroxide in 1,1,1,3,3,3-Hexafluoro-2-propanol Reveal a Crucial Catalytic Role for Solvent Clusters

Adv. Synth. Catal. 2004, 346, 275-280

Albrecht Berkessel\*, Jens A. Adrio



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Selectivity up to 99%

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## 281 Cyclohexene and Cyclooctene Epoxidation with Aqueous Hydrogen Peroxide using Transition Metal-Free Sol-Gel Alumina as Catalyst

Adv. Synth. Catal. 2004, 346, 281-285

Roberto Rinaldi, Jorge Sepúlveda, Ulf Schuchardt\*

OH OH 
$$A_{1}$$
  $A_{2}$   $A_{2}$   $A_{3}$   $A_{4}$   $A_{2}$   $A_{4}$   $A_{5}$   $A_{5}$ 

## 286 Aerobic Oxidation of Cycloalkanes, Alcohols and Ethylbenzene Catalyzed by the Novel Carbon Radical Chain Promoter NHS (*N*-Hydroxysaccharin)

Adv. Synth. Catal. 2004, 346, 286-296

Xavier Baucherel, Luca Gonsalvi, Isabel W. C. E. Arends, Simon Ellwood, Roger A. Sheldon\*

## 297 The Complex Synergy of Water in the Metal/Bromide Autoxidation of Hydrocarbons Caused by Benzylic Bromide Formation

Adv. Synth. Catal. 2004, 346, 297-306

Walt Partenheimer

# **307** Is it Possible to Achieve Highly Selective Oxidations in Supercritical Water? Aerobic Oxidation of Methylaromatic Compounds

Adv. Synth. Catal. 2004, 346, 307-316

Eduardo Garcia-Verdugo, Eleni Venardou, W. Barry Thomas, Keith Whiston, Walter Partenheimer, Paul A. Hamley, Martyn Poliakoff\*

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Hydrogen Peroxide Oxygenation of Alkanes Including Methane and Ethane Catalyzed by Iron Complexes in Acetonitrile

Adv. Synth. Catal. 2004, 346, 317-332

Georgiy B. Shul'pin,\* Galina V. Nizova, Yuriy N. Kozlov, Laura Gonzalez Cuervo, Georg Süss-Fink

Titanium Silicalite 1 (TS-1) Catalyzed Oxidative Transformations of Furan Derivatives with Hydrogen Peroxide

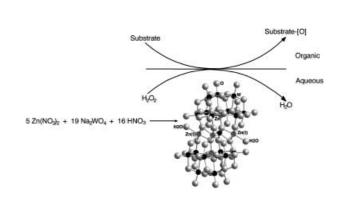
Adv. Synth. Catal. 2004, 346, 333-338

Joos Wahlen, Bart Moens, Dirk E. De Vos, Paul L. Alsters, Pierre A. Jacobs\*

Aqueous Biphasic Oxidation: A Water-Soluble Polyoxometalate Catalyst for Selective Oxidation of Various Functional Groups with Hydrogen Peroxide

Adv. Synth. Catal. 2004, 346, 339-345

Dorit Sloboda-Rozner, Peter Witte, Paul L. Alsters, Ronny Neumann\*



A Simple and Highly Selective Biomimetic Oxidation of Alcohols and Epoxides with N-Bromosuccinimide in the Presence of  $\beta$ -Cyclodextrin in Water

Adv. Synth. Catal. 2004, 346, 346-350

N. Srilakshmi Krishnaveni, K. Surendra, K. Rama Rao\*

OH NBS/
$$\beta$$
-Cyclodextrin O 346

 $R^1$   $H_2O$ /room temperature

Expedient Synthesis of 4-Dialkylamino-5*H*-furan-2-ones by One-Pot Sequential Pd-Catalyzed Oxidative Carbonylation of 2-Yn-1-ols – Conjugate Addition-Lactonization

Adv. Synth. Catal. 2004, 346, 351 – 358

Bartolo Gabriele,\* Giuseppe Salerno, Pierluigi Plastina, Mirco Costa, Alessandra Crispini

$$R_{2}^{1} = + CO + R_{2}^{3}NH + (1/2) O_{2} \xrightarrow{Pdl_{2} cat} R_{2}^{3}N$$

$$R_{2}^{3}N = R_{2}^{3}N + CO + R_{2}^{3}NH + (1/2) O_{2} \xrightarrow{Pdl_{2} cat} R_{2}^{3}N + CO + R_{2}^{3}NH + (1/2) O_{2} \xrightarrow{Pdl_{2} cat} R_{2}^{3}N + CO + R_{2}^{3}NH + (1/2) O_{2} \xrightarrow{Pdl_{2} cat} R_{2}^{3}N + CO + R_{2}^{3}NH + (1/2) O_{2} \xrightarrow{Pdl_{2} cat} R_{2}^{3}N + CO + R_{2}^{3}NH + (1/2) O_{2} \xrightarrow{Pdl_{2} cat} R_{2}^{3}N + CO + R_{2}^{3}NH + (1/2) O_{2} \xrightarrow{Pdl_{2} cat} R_{2}^{3}N + CO + R_{2}^{3}NH + (1/2) O_{2} \xrightarrow{Pdl_{2} cat} R_{2}^{3}N + CO + R_{2}^{3}NH + (1/2) O_{2} \xrightarrow{Pdl_{2} cat} R_{2}^{3}N + CO + R_{2}^{3}NH + (1/2) O_{2} \xrightarrow{Pdl_{2} cat} R_{2}^{3}N + CO + R_{2}^{3}NH + (1/2) O_{2} \xrightarrow{Pdl_{2} cat} R_{2}^{3}N + CO + R_{2}^{3}NH + (1/2) O_{2} \xrightarrow{Pdl_{2} cat} R_{2}^{3}N + CO + R_{2}^{3}NH + (1/2) O_{2} \xrightarrow{Pdl_{2} cat} R_{2}^{3}N + CO + R_{2}^{3}NH + (1/2) O_{2} \xrightarrow{Pdl_{2} cat} R_{2}^{3}N + CO + R_{2}^{3}NH + (1/2) O_{2} \xrightarrow{Pdl_{2} cat} R_{2}^{3}N + CO + R_{2}^{3}NH + (1/2) O_{2} \xrightarrow{Pdl_{2} cat} R_{2}^{3}N + CO + R_{2}^{3}NH + (1/2) O_{2} \xrightarrow{Pdl_{2} cat} R_{2}^{3}N + CO + R_{2}^{3}NH + (1/2) O_{2} \xrightarrow{Pdl_{2} cat} R_{2}^{3}N + CO + R_{2}^{3}NH + (1/2) O_{2} \xrightarrow{Pdl_{2} cat} R_{2}^{3}N + CO + R_{2}^{3}NH + (1/2) O_{2} \xrightarrow{Pdl_{2} cat} R_{2}^{3}N + CO + R_{2}^{3}NH + (1/2) O_{2} \xrightarrow{Pdl_{2} cat} R_{2}^{3}N + CO + R_{2}^{3}NH + (1/2) O_{2} \xrightarrow{Pdl_{2} cat} R_{2}^{3}N + CO + R_{2}^{3}NH + (1/2) O_{2} \xrightarrow{Pdl_{2} cat} R_{2}^{3}N + CO + R_{2}^{3}N +$$

Adv. Synth. Catal. 2004, 346, 95-102

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**359** Catalytic Aerobic Generation of Acyliminium Ions through Electron-Transfer-Mediated Carbon-Carbon Bond Activation

Adv. Synth. Catal. 2004, 346, 359-366

Danielle L. Aubele, Jason C. Rech, Paul E. Floreancig\*

**367** Biocatalytic Potential of *p*-Hydroxybenzoate Hydroxylase from *Rhodococcus rhodnii* 135 and *Rhodococcus opacus* 557

Adv. Synth. Catal. 2004, 346, 367-375

Andrei P. Jadan, Mariëlle J. H. Moonen, Sjef Boeren, Ludmila A. Golovleva, Ivonne M. C. M. Rietjens, Willem J. H. van Berkel\*

HO

$$R$$
 $R = CI, F$ 
 $R$ 
 $R = OH, CI, F$ 
 $R$ 
 $R = OH$ 
 $OH$ 
 $OH$ 

Supporting information on the WWW (see article for access details).

\*Author to whom correspondence should be addressed.

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