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Cover

See Jan-E. Bäckvall, Pher G. Andersson, *et al.*, page 237, and Serafino Gladiali and Elisabetta Alberico, page 226.

The cover shows hydrogen transfer superimposed on a photo of the centre of the Swan Nebula, or M17, a hotbed of newly born stars wrapped in colourful blankets of glowing gas and cradled in an enormous cold, dark hydrogen cloud.

Photo: NASA/ESA–ACS Science Team.



Inside cover

See Masakatsu Shibasaki and Shigeki Matsunaga, page 269. Linked-BINOLs with coordinative heteroatom linker create a unique and effective chiral environment that is not accessible from BINOL itself. Image reproduced by permission of Masakatsu Shibasaki and Shigeki Matsunaga from *Chem. Soc. Rev.*, 2006, 35, 269.

CHEMICAL SCIENCE

C17

Drawing together the research highlights and news from all RSC publications, *Chemical Science* provides a 'snapshot' of the latest developments across the chemical sciences showcasing newsworthy articles, as well as the most significant scientific advances.

Chemical Science

March 2006/Volume 3/Issue 3

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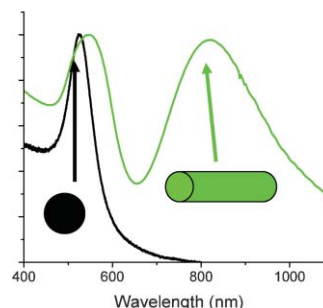
TUTORIAL REVIEWS

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Why gold nanoparticles are more precious than pretty gold: Noble metal surface plasmon resonance and its enhancement of the radiative and nonradiative properties of nanocrystals of different shapes

Susie Eustis and Mostafa A. El-Sayed*

Differences in the optical properties of gold nanospheres and nanorods.



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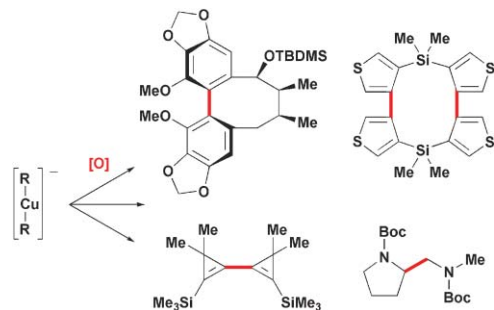
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The oxidation of organocuprates—an offbeat strategy for synthesis

David S. Surry and David R. Spring*

Organocuprate oxidation is a reaction that allows an unusual disconnection of a carbon–carbon or a carbon–nitrogen bond back to two anions, and is effective for some of the most challenging bond forming reactions. This *tutorial review* introduces the under exploited reaction and the recent developments that have served to improve its utility in organic synthesis.

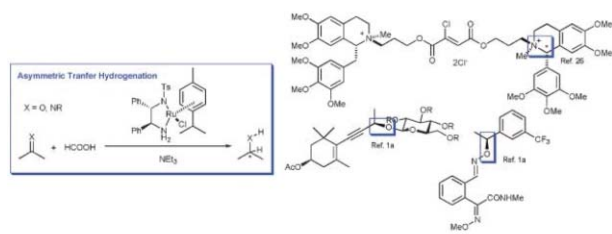


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Asymmetric transfer hydrogenation: chiral ligands and applications

Serafino Gladiali* and Elisabetta Alberico

Asymmetric Transfer Hydrogenation is a mild methodology for the reduction of ketones and imines in the presence of an hydrogen donor such as *iso*-propanol or formic acid. The reaction is catalyzed by metal complexes of Ru, Rh and Ir modified by chiral ligands among which monotosylated diamines and amino alcohols provide the best catalysts.

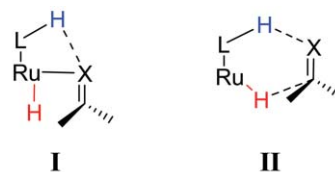


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Mechanistic aspects of transition metal-catalyzed hydrogen transfer reactions

Joseph S. M. Samec, Jan-E. Bäckvall,* Pher G. Andersson* and Peter Brandt

Small modifications of the ligand of the catalyst or even the substrate may change the mechanism of hydrogen transfer from an inner-sphere reaction (**I**, *via* coordination of substrate) to an outer-sphere process (**II**).

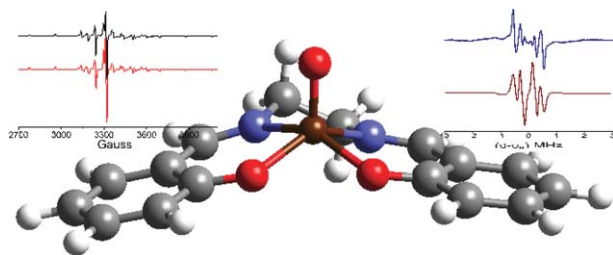


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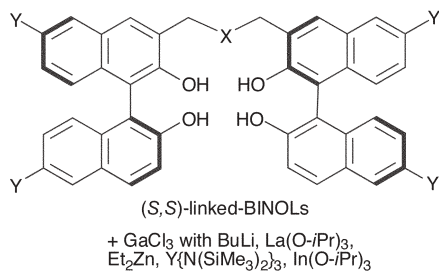
Principles and applications of ENDOR spectroscopy for structure determination in solution and disordered matrices

Damien M. Murphy* and Robert D. Farley

The basic principles of solution and orientation selective ENDOR, for structure determination of paramagnetic metal complexes in frozen solution, are outlined in this *tutorial review* and a number of selected examples of the techniques are presented.



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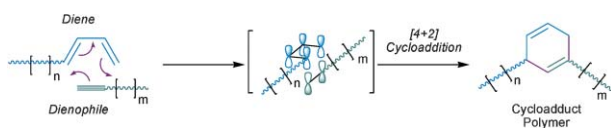
Design and application of linked-BINOL chiral ligands in bifunctional asymmetric catalysis

Masakatsu Shibasaki* and Shigeki Matsunaga*

Linked-BINOLs with coordinative heteroatom linker create a unique and effective chiral environment that is not accessible from BINOL itself.

CRITICAL REVIEW

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Advances in cycloaddition polymerizations

Glenn W. Goodall and Wayne Hayes*

This *critical review* highlights recent notable advances in the field of cycloaddition polymerizations. Use of cycloaddition reactions in polymerizations allows rapid access to linear, hyperbranched and cross-linked polymer architectures that feature interesting heterocyclic or strained multicyclic units within the polymer backbone.

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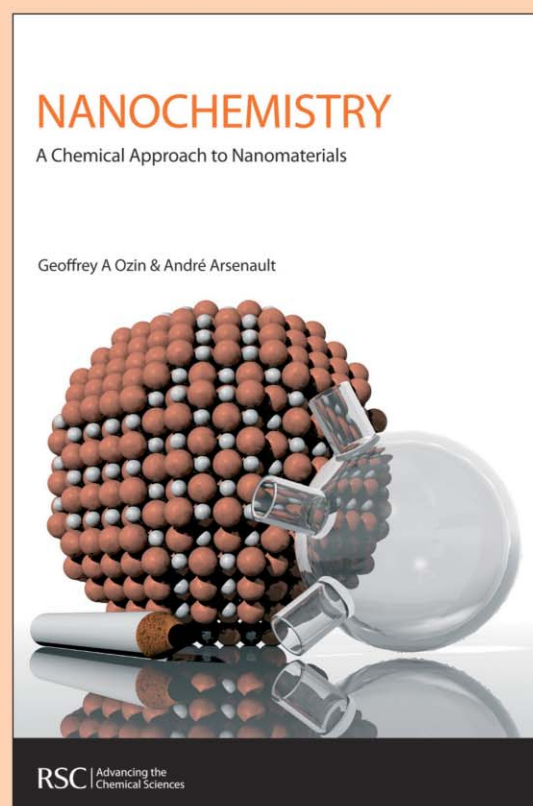
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