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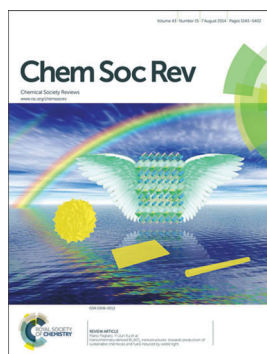
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ISSN 0306-0012 CODEN CSRVBR 43(15) 5143–5402 (2014)



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See Yanguang Li and Hongjie Dai, pp. 5257–5275. Image reproduced by permission of Yanguang Li from *Chem. Soc. Rev.*, 2014, **43**, 5257.



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See Mario Pagliaro, Yi-Jun Xu *et al.*, pp. 5276–5287. Image reproduced by permission of Yi-Jun Xu from *Chem. Soc. Rev.*, 2014, **43**, 5276.

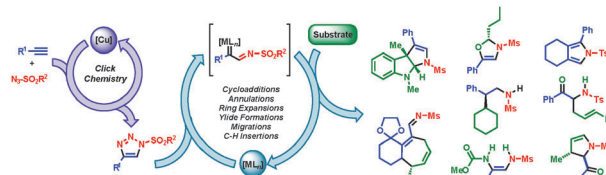
TUTORIAL REVIEWS

5151

Reactions of metallocarbenes derived from *N*-sulfonyl-1,2,3-triazoles

Huw M. L. Davies* and Joshua S. Alford

Metal-stabilized carbenes derived from *N*-sulfonyl triazoles have become broadly useful reactive intermediates for organic synthesis.

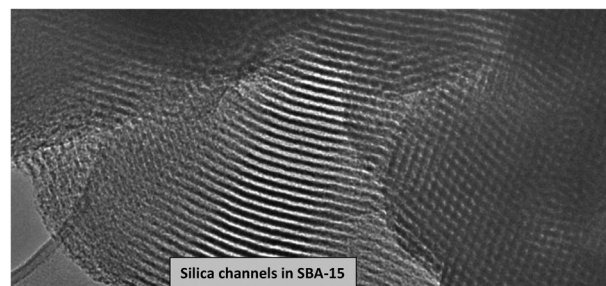


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Mesosilica materials and organic pollutant adsorption: part A removal from air

L. T. Gibson

This tutorial review focuses on the application of mesoporous silica materials, primarily MCM-41 and SBA-15, for the removal of organic pollutants in the vapour phase.



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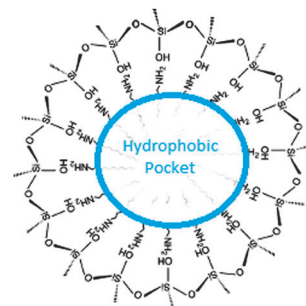
TUTORIAL REVIEWS

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Mesosilica materials and organic pollutant adsorption: part B removal from aqueous solution

L. T. Gibson

This tutorial review will focus on the removal of organic pollutants from the aqueous phase by mesoporous silica.

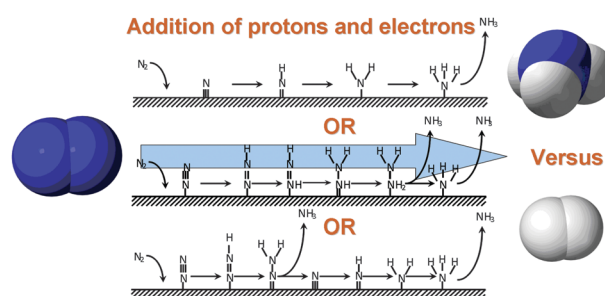


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Challenges in reduction of dinitrogen by proton and electron transfer

Cornelis J. M. van der Ham, Marc T. M. Koper and Dennis G. H. Hetterscheid*

Catalytic reduction of dinitrogen with protons and electrons is a very challenging alternative to the energy expensive Haber–Bosch reaction.

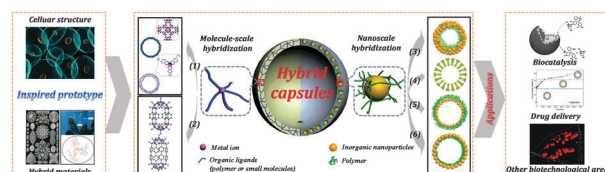


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Design and synthesis of organic–inorganic hybrid capsules for biotechnological applications

Jiafu Shi, Yanjun Jiang, Xiaoli Wang, Hong Wu, Dong Yang, Fusheng Pan, Yanlei Su and Zhongyi Jiang*

The design, synthesis and biotechnological applications of organic–inorganic hybrid capsules are briefly reviewed and selectively highlighted.

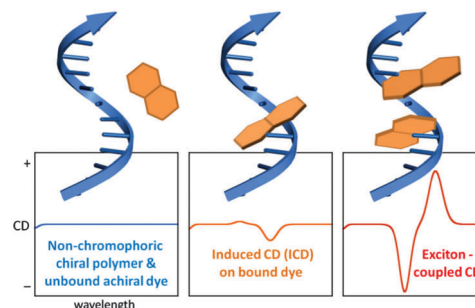


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Application of electronic circular dichroism in the study of supramolecular systems

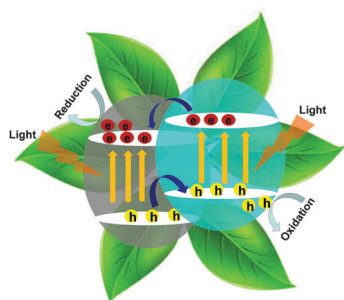
Gennaro Pescitelli, Lorenzo Di Bari* and Nina Berova*

Electronic circular dichroism (ECD) is a choice technique for the analysis of chiral supramolecular systems, including their detection, determination of thermodynamic and kinetic quantities, and structural elucidation.



TUTORIAL REVIEWS

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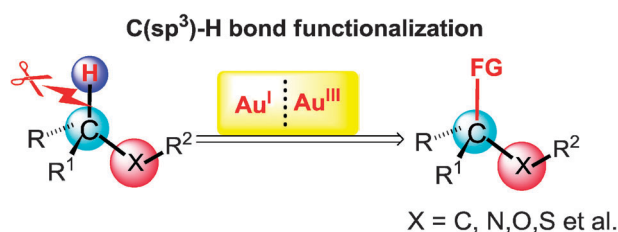


Semiconductor heterojunction photocatalysts: design, construction, and photocatalytic performances

Huanli Wang, Lisha Zhang,* Zhigang Chen, Junqing Hu, Shijie Li, Zhaohui Wang, Jianshe Liu* and Xinchun Wang*

The design, construction, and photocatalytic performances of semiconductor heterojunction photocatalysts are briefly reviewed and selectively highlighted.

5245



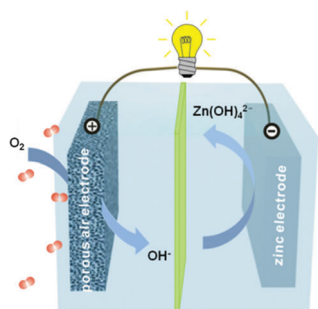
Gold-catalyzed C(sp³)-H bond functionalization

Jin Xie, Changduo Pan, Ablimit Abdukader and Chengjian Zhu*

Homogeneous gold-catalyzed sp³ C-H bond functionalization strategy opens a new avenue for economical and sustainable construction of fine chemicals.

REVIEW ARTICLES

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Recent advances in zinc-air batteries

Yanguang Li* and Hongjie Dai*

In this review, the fundamentals, challenges and latest exciting advances related to zinc-air research are highlighted.

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Nanochemistry-derived Bi₂WO₆ nanostructures: towards production of sustainable chemicals and fuels induced by visible light

Nan Zhang, Rosaria Ciriminna, Mario Pagliaro* and Yi-Jun Xu*

The advances of Bi₂WO₆ nanostructures utilized in photocatalytic organic synthesis and fuel production under visible light are discussed and prospected.

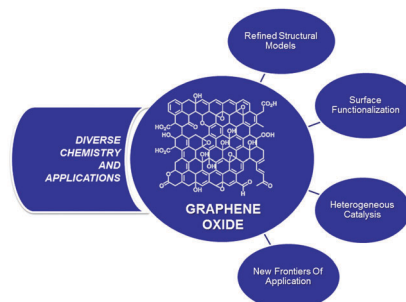
REVIEW ARTICLES

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Harnessing the chemistry of graphene oxide

Daniel R. Dreyer, Alexander D. Todd and Christopher W. Bielawski*

The chemistry of graphene oxide is revisited, and includes an update on recent developments and potential applications.

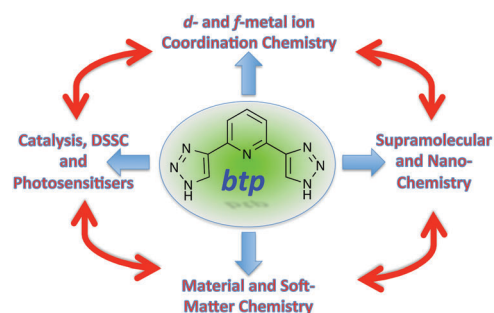


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The **btp** [2,6-bis(1,2,3-triazol-4-yl)pyridine] binding motif: a new versatile terdentate ligand for supramolecular and coordination chemistry

Joseph P. Byrne,* Jonathan A. Kitchen and Thorfinnur Gunnlaugsson*

Here we review the progress made to date in the synthesis and applications of ligands based on the **btp** [2,6-bis(1,2,3-triazol-4-yl)pyridine] motif; but these have recently become an important new class of ligands for use in coordination and supramolecular chemistry.

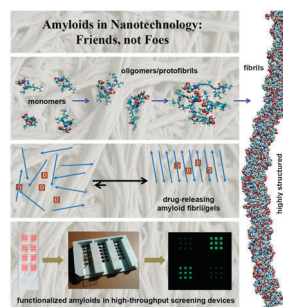


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Amyloid-based nanosensors and nanodevices

Charlotte A. E. Hauser,* Sebastian Maurer-Stroh and Ivo C. Martins*

Exploring amyloid-like peptides and proteins for applications in nanotechnology will open up new strategies for potential applications, such as biomedical therapies, biosensing, disease diagnostics, biomarker screening, bioimaging and monitoring.

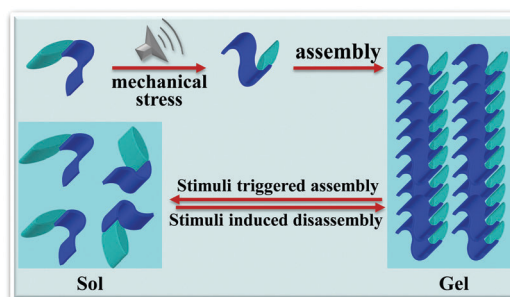


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Low-molecular-mass gels responding to ultrasound and mechanical stress: towards self-healing materials

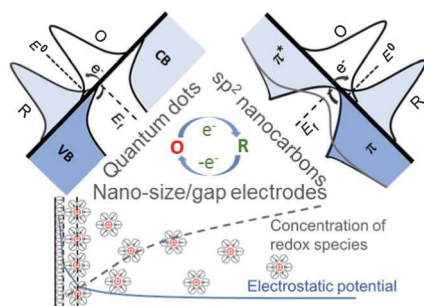
Xudong Yu, Liming Chen, Mingming Zhang and Tao Yi*

Ultrasound and mechanical stress-driven/-responsive LMOGs, which are used extensively to construct self-healing materials with reversibility, are highlighted.



REVIEW ARTICLES

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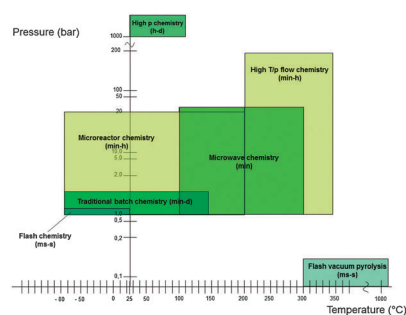


Heterogeneous electron transfer at nanoscopic electrodes: importance of electronic structures and electric double layers

Shengli Chen,* Yuwen Liu and Junxiang Chen

Recent insights into the nanoscopic electrode size and structure effects on heterogeneous ET kinetics are presented.

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Anthropogenic reaction parameters – the missing link between chemical intuition and the available chemical space

György M. Keserű,* Tibor Soós* and C. Oliver Kappe*

Anthropogenic factors limit reaction parameters and thus the scope of synthetic chemistry, nevertheless, their role is both advantageous and critical.