

IN THIS ISSUE

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Cover

See Polly L. Arnold, Fritz E. Kühn, Andrew D. Smith *et al.*, pp. 8035–8045. Image reproduced by permission of Polly L. Arnold from *Chem. Sci.*, 2018, 9, 8035. Image by Dr. Johannes Richers (www.jorichers.com).



Inside cover

See Niko Hildebrandt *et al.*, pp. 8046–8055. Image reproduced by permission of Niko Hildebrandt from *Chem. Sci.*, 2018, 9, 8046.

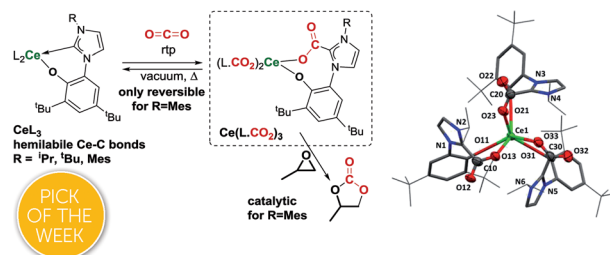
EDGE ARTICLES

8035

Selective and catalytic carbon dioxide and heteroallene activation mediated by cerium N-heterocyclic carbene complexes

P. L. Arnold,* R. W. F. Kerr, C. Weetman, S. R. Docherty, J. Rieb, F. L. Cruickshank, K. Wang, C. Jandl, M. W. McMullon, A. Pöthig, F. E. Kühn* and A. D. Smith*

A series of rare earth complexes of the form $\text{Ln}(\text{L}^{\text{R}})_3$ supported by bidentate *ortho*-aryloxide–NHC ligands are reported ($\text{L}^{\text{R}} = \text{O}(\text{o}-\text{C}_6\text{H}_2-\text{tBu}_2-2,6-\text{CN}(\text{C}_2\text{H}_2)\text{NR})$; $\text{R} = \text{tPr}, \text{tBu}, \text{Mes}$; $\text{Ln} = \text{Ce}, \text{Sm}, \text{Eu}$).

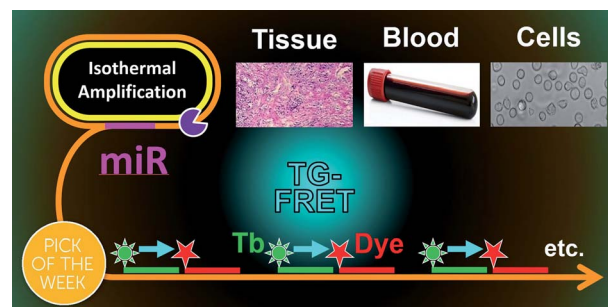


8046

Advanced microRNA-based cancer diagnostics using amplified time-gated FRET

Xue Qiu, Jingyue Xu, Jiajia Guo, Akram Yahia-Ammar, Nikiforos-Ioannis Kapetanakis, Isabelle Duroux-Richard, Julia J. Unterluggauer, Nicole Golob-Schwarzl, Christophe Regeard, Catherine Uzan, Sébastien Gouy, Michael DuBow, Johannes Haybaeck, Florence Apparailly, Pierre Busson and Niko Hildebrandt*

FRET and rolling circle amplification outperform RT-qPCR for microRNA diagnostics in clinical samples.



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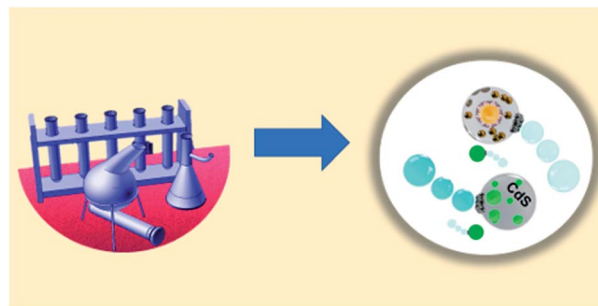
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8056

Lab-on-a-micromotor: catalytic Janus particles as mobile microreactors for tailored synthesis of nanoparticles

Marta Pacheco, Beatriz Jurado-Sánchez* and Alberto Escarpa*

Catalytic Janus micromotors encapsulating Cd^{2+} or citrate are used here as mobile microreactors for “on the fly” CdS quantum dot and gold nanoparticle synthesis.

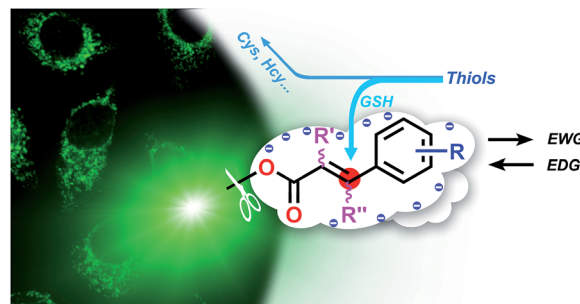


8065

Fluorescent probes guided by a new practical performance regulation strategy to monitor glutathione in living systems

Mengyao She, Zhaohui Wang, Tianyou Luo, Bing Yin, Ping Liu, Jing Liu, Fulin Chen,* Shengyong Zhang and Jianli Li*

A practical regulation strategy for the design of glutathione specific probes and their application in living systems.

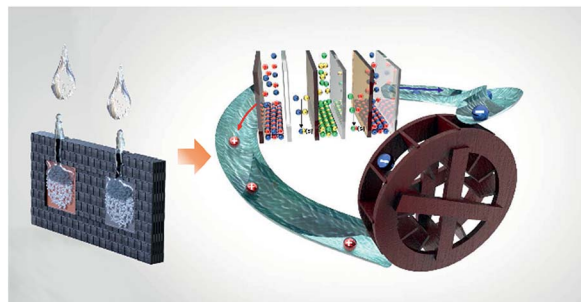


8071

A miniaturized solid salt reverse electrodialysis battery: a durable and fully ionic power source

Song Yi Yeon, Jeongse Yun, Sun-heui Yoon, Dahye Lee, Woohyuk Jang, Seok Hee Han, Chung Mu Kang and Taek Dong Chung*

A convenient, miniaturized reverse electrodialysis battery to provide long-lasting and reliable ionic electricity is developed.

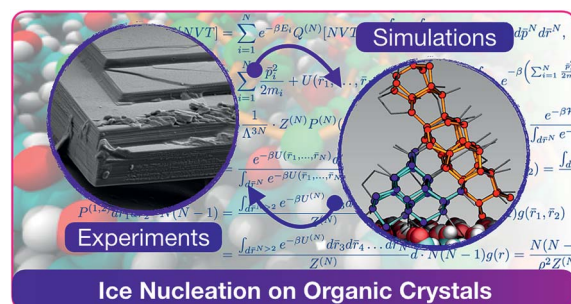


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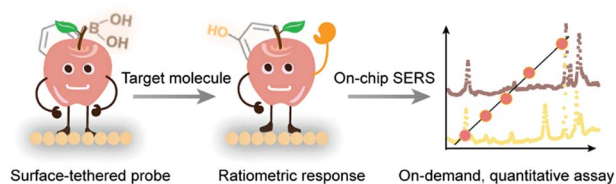
Unravelling the origins of ice nucleation on organic crystals

Gabriele C. Sosso,* Thomas F. Whale, Mark A. Holden, Philipp Pedevilla, Benjamin J. Murray and Angelos Michaelides

Organic molecules such as steroids or amino acids form crystals that can facilitate the formation of ice – arguably the most important phase transition on earth.



8089

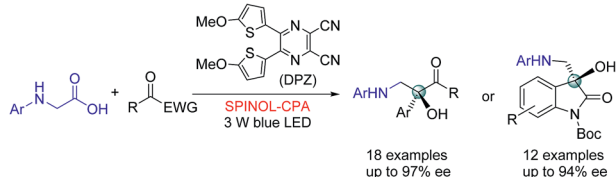


On-demand quantitative SERS bioassays facilitated by surface-tethered ratiometric probes

Kun Zhang, Yuning Wang, Meiling Wu, Yujie Liu, Dongyun Shi and Baohong Liu*

A robust chip-based SERS concept for quantitative on-demand metabolite screening is established.

8094



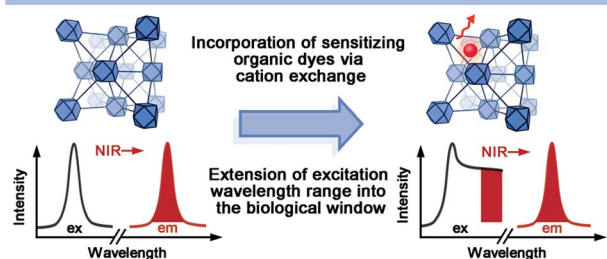
Catalytic enantioselective radical coupling of activated ketones with *N*-aryl glycines

Yang Liu, Xiangyuan Liu, Jiangtao Li, Xiaowei Zhao, Baokun Qiao and Zhiyong Jiang*

Asymmetric H-bonding catalysis as a viable strategy for enantioselective radical coupling of ketones is demonstrated.

8099

RE³⁺-MOFs with near infrared excitation and emission

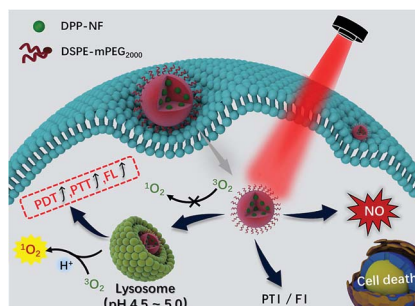


Near infrared excitation and emission in rare earth MOFs via encapsulation of organic dyes

Chong Liu, Svetlana V. Eliseeva, Tian-Yi Luo, Patrick F. Muldoon, Stéphane Petoud* and Nathaniel L. Rosi*

Dye RE³⁺-MOF hybrid exhibits both NIR excitation and emission within the biological diagnostic window, highlighting its potential for biological imaging.

8103



A light-induced nitric oxide controllable release nano-platform based on diketopyrrolopyrrole derivatives for pH-responsive photodynamic/ photothermal synergistic cancer therapy

Y. Wang, X. Huang, Y. Tang, J. Zou, P. Wang, Y. Zhang,* W. Si,* W. Huang and X. Dong*

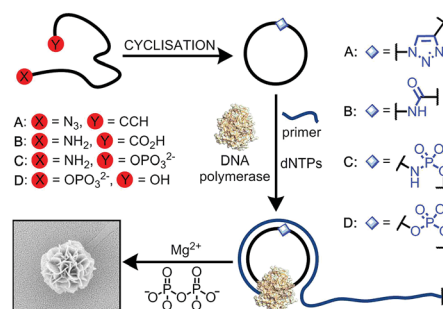
An intelligent multifunctional nano-platform responsive to the tumor microenvironment was established, which showed NO controllable "on-off" release and enhanced photodynamic/photothermal synergistic cancer therapy.

8110

Enzyme-free synthesis of cyclic single-stranded DNA constructs containing a single triazole, amide or phosphoramidate backbone linkage and their use as templates for rolling circle amplification and nanoflower formation

Jinfeng Chen, Ysobel R. Baker, Asha Brown, Afaf H. El-Sagheer and Tom Brown*

Three different chemical cyclisation reactions yield biocompatible cyclic oligonucleotide templates for use in RCA and DNA nanoflower formation.

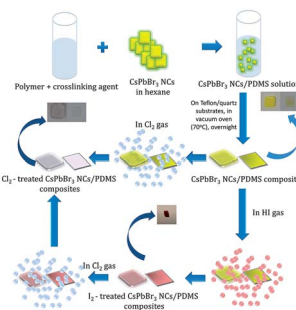


8121

Anion exchange in inorganic perovskite nanocrystal polymer composites

Maria Sygletou,* Maria-Eleni Kyriazi, Antonios G. Kanaras and Emmanuel Stratakis*

We demonstrate a facile, low-cost and room-temperature method of anion exchange in cesium lead bromide nanocrystals (CsPbBr₃ NCs), embedded into a polymer matrix.

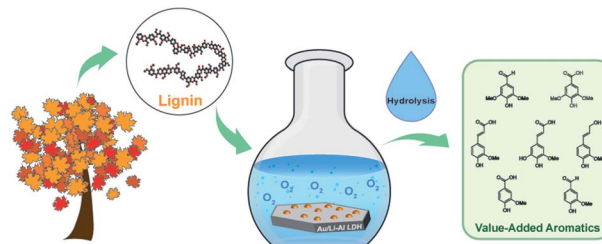


8127

Gold-catalyzed conversion of lignin to low molecular weight aromatics

Yang Song, Justin K. Mobley, Ali Hussain Motagamwala, Mark Isaacs, James A. Dumesic, John Ralph, Adam F. Lee, Karen Wilson and Mark Crocker*

Gold nanoparticles supported on lithium–aluminum layered double hydroxide function as a heterogeneous catalyst for oxidative depolymerization of lignin to low molecular weight aromatics under mild conditions.

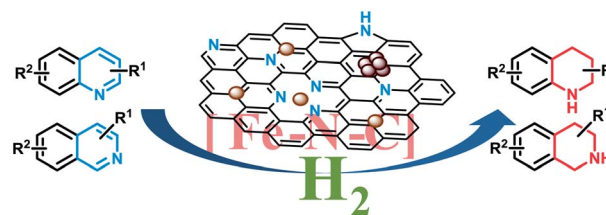


8134

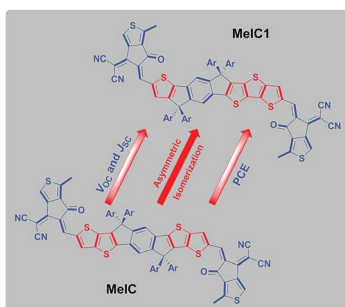
A robust iron catalyst for the selective hydrogenation of substituted (iso)quinolones

Basudev Sahoo, Carsten Kreyenschulte, Giovanni Agostini, Henrik Lund, Stephan Bachmann, Michelangelo Scalone, Kathrin Junge and Matthias Beller*

By applying N-doped carbon modified iron-based catalysts, the controlled hydrogenation of N-heteroarenes is achieved.



8142

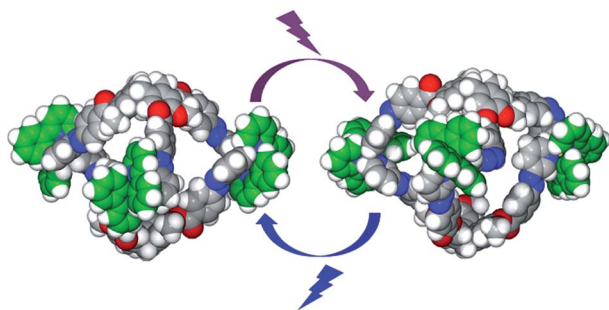


Designing an asymmetrical isomer to promote the LUMO energy level and molecular packing of a non-fullerene acceptor for polymer solar cells with 12.6% efficiency

Wei Gao, Qiaoshi An, Cheng Zhong, Zhenghui Luo, Ruijie Ming, Miao Zhang, Yang Zou, Feng Liu,* Fujun Zhang* and Chuluo Yang*

PSCs based on PBDB-T:MeIC1 achieved a larger V_{OC} and J_{SC} and thus boosted the PCE compared to PBDB-T:MeIC-based PSCs.

8150



Structure-switching M_3L_2 Ir(III) coordination cages with photo-isomerising azo-aromatic linkers

Samuel Oldknow, Diego Rota Martir, Victoria E. Pritchard, Mark A. Blitz, Colin W. G. Fishwick, Eli Zysman-Colman and Michael J. Hardie*

Deep-blue luminescent $[Ir(C^N)_2]_3(L)_2^{3+}$ coordination cages with structurally integral pyridyl-azo-phenyl groups can be reversibly photo-isomerised with no compositional change.