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Cover
See Mitsuharu Chisaka *et al.*, pp. 5669–5677.
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Inside cover
See David Eisenberg *et al.*, pp. 5678–5689.
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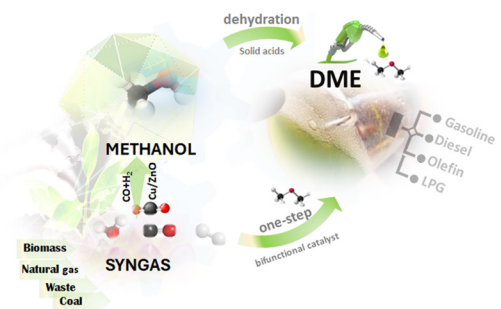
The authors would like to acknowledge Efrat (eshkat) Bronstein for the cover design.

REVIEWS

5552

From CO_2 to DME: catalytic advances, challenges, and alternatives to conventional gas-phase routes

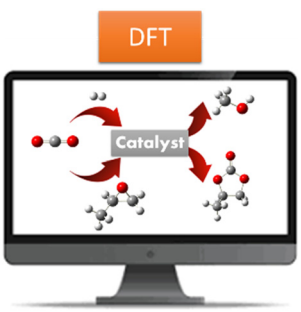
Elka Kraleva,* Udo Armbruster, Maria Luisa Saladino, Francesco Giacalone,* Tomoo Mizugaki and Izabela S. Pieta*



5574

Advances in CO_2 capture and utilization: the role of DFT in understanding CO_2 activation and its conversion mechanisms for methanol and cyclic carbonates production

Valeria Butera* and Giampaolo Barone



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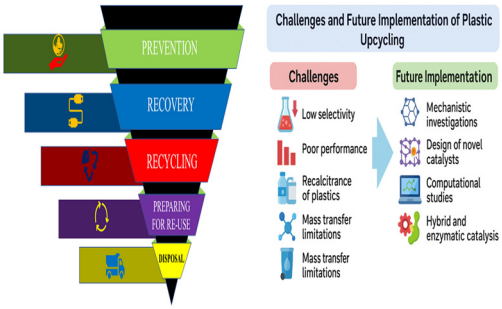
REVIEWS

5602

Advanced strategies for plastic upcycling: unlocking sustainable waste valorization pathways for a green and sustainable environment

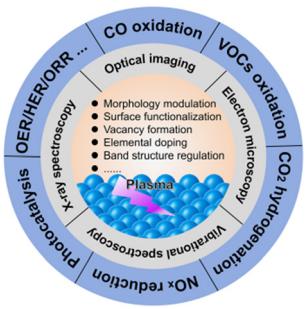
Talaat Hassan Habeeb* and Umar Farooq*



5635

Plasma-assisted surface modification of heterogeneous catalysts: principles, characterization, and applications

Si Jiang, Yong Yin, Yang Zhang, Zimeng Li, Shuai Guo, Yaogeng Lu, Zhaoxi Zhang, Tianle Zhu, Yifei Sun and Xiang Li*

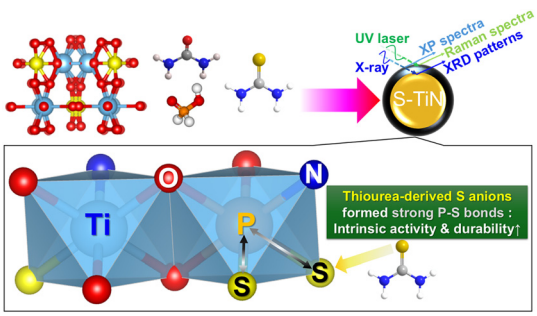


PAPERS

5669

Strengthening P–S bonding in TiO_2 for enhanced fuel cell startup/shutdown durability with an N, P, S–TiO_2/S–TiN catalyst

Mitsuharu Chisaka,* Jubair A. Shamim and Hirofumi Daiguji



5678

Biomass or bio-mess: tackling reproducibility in biomass-derived carbon electrocatalysts

Shir Tabac-Agam, Shelly Burda, Syeda M. Zahan, Dario R. Dekel and David Eisenberg*

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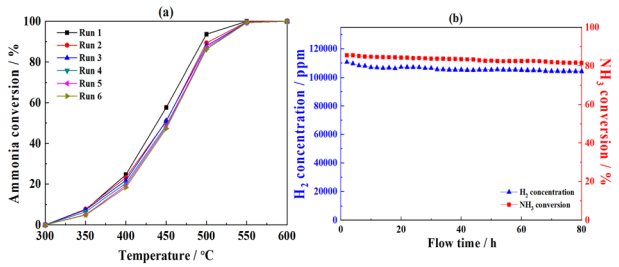
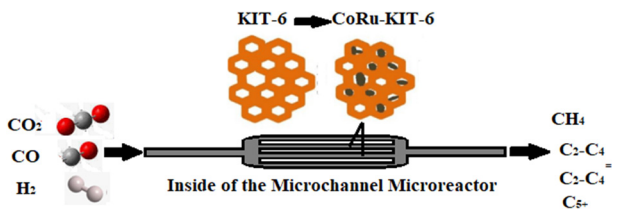
5690



Development of non-noble Ni metal-based $(Yb_{1-x}Co_x)_2O_{3-\delta}$ catalysts for green H_2 production *via* ammonia decomposition

Yeon-Bin Choi, Tae Wook Kang, Seo Ra Woo, Do yun Kim, Sun Woog Kim and Byungseo Bae*

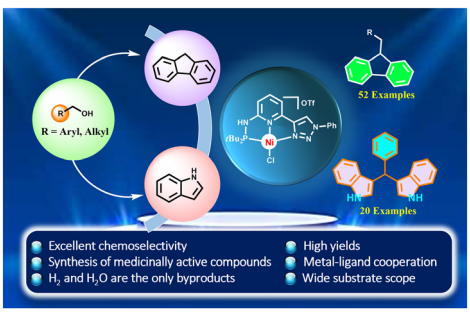
5700



Fischer–Tropsch synthesis of CO_2-rich syngas using a CoRu-KIT-6 catalyst in a 3D-printed stainless steel (SS) microchannel microreactor

Sujoy Bepari, Nafeezuddin Mohammad and Debasish Kuila*

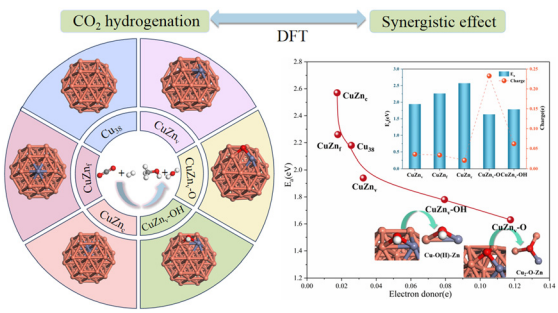
5713



Efficient C(sp^3)–H alkylation of fluorene and bisindolylmethane synthesis catalysed by a PNN-Ni complex using alcohols

Manali A. Mohite and Maravanji S. Balakrishna*

5724



Zn and O/OH synergy in H_2 activation and CO_2 hydrogenation over Cu nanoparticles catalysts

Caixia Song, Xiaojiao Zhang, Xuan Zhao, Yiwei Jia, Dong Duan and Hui Li*

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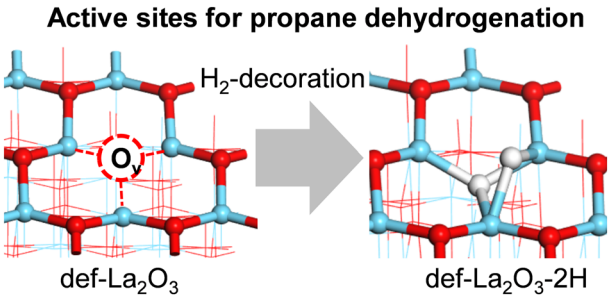
PAPERS

5737

Bare La_2O_3 in non-oxidative propane dehydrogenation: *in situ* decoration of active sites for enhanced catalyst performance

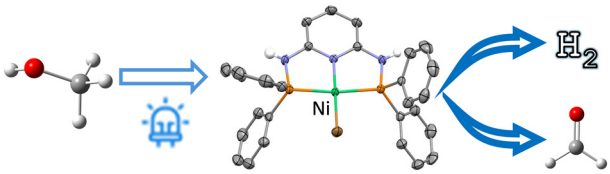
Tatiana Otroshchenko,* Shanlei Han, Thanh Huyen Vuong, Vita A. Kondratenko, Jabor Rabeah, Stephan Bartling and Evgenii V. Kondratenko*



5747

Hydrogen production through photocatalytic acceptorless alcohol dehydrogenation with a homogeneous nickel complex

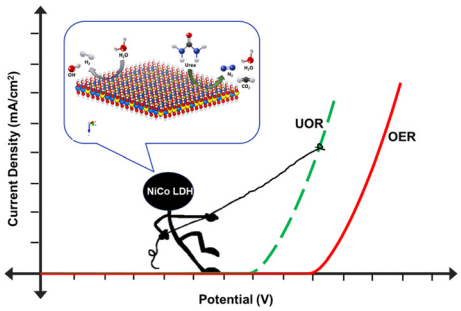
Eman Mohamad and Darrin Richeson*



5753

Urea-assisted hydrogen production: insights into Ni(Co, Mn) LDH-based multifunctional electrocatalysts

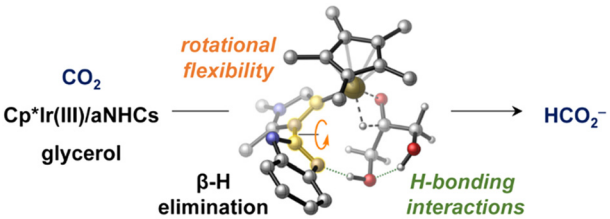
Subramanian Rajalekshmi, Kodiyarasu Sooriya, Suresh Varsha and Alagarsamy Pandikumar*



5765

Computational insights into Ir-catalyzed transfer hydrogenation of CO_2 to formate: critical roles of abnormal NHC ligands and hydrogen donors

Han Gao, Xiaofang Zhai, Feng Ye, Wujie Wang,* Gang Lu* and Yuliang Li*



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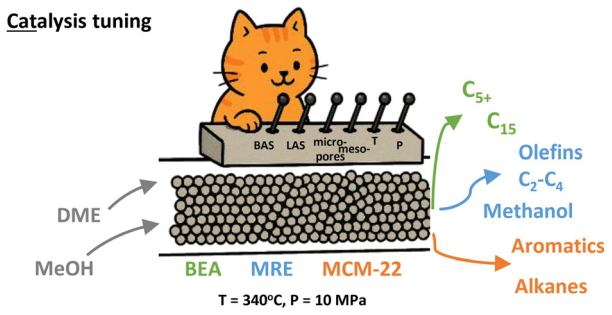
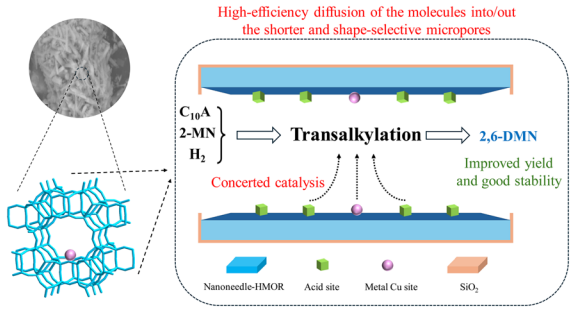


Conversion of dimethyl ether and methanol to hydrocarbons over zeolites with BEA, MRE, and MWW structures

Maria V. Magomedova, Vera A. Ostroumova, Ilya A. Davidov, Ekaterina G. Galanova, Anastasiya V. Starozhitskaya* and Anton L. Maximov

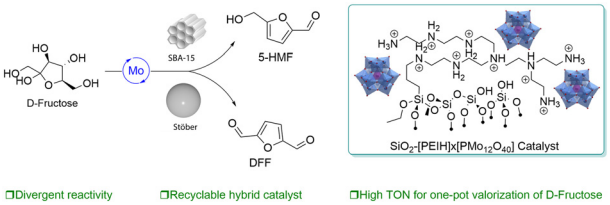
5782



High-efficiency transalkylation of C_{10} aromatics with 2-methylnaphthalene over shape-selective SiO_2-Cu-HMOR with nanoneedle crystals

Jiahao Wang, Qihao Yang and Junhui Li*

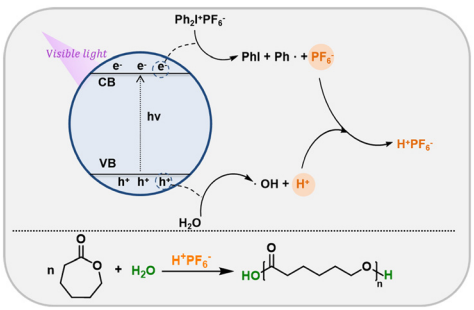
5794



Catalytic valorisation of D-fructose and alcohols using silica–PEI–polyoxometalate composites

Israel T. Pulido-Díaz, Itzel Guerrero-Ríos* and Dominique Agustin*

5807



Photocatalyzed ring-opening polymerization of ε-caprolactone

Yicheng Fan, Xiuyuan Ni* and Wenbin Fu

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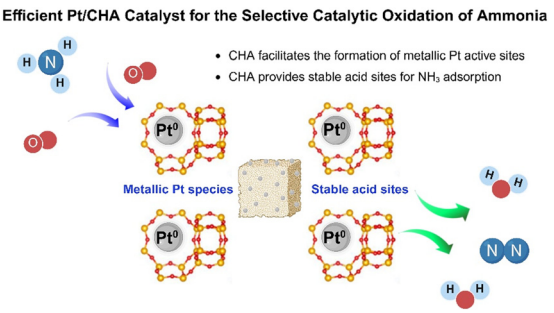
Unveiling the support effect in Pt-based catalysts for the selective catalytic oxidation of NH_3 under realistic diesel engine conditions

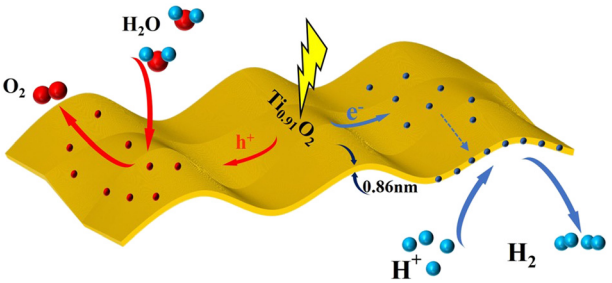
Daekun Kim, Shaohua Xie,* Kailong Ye, Xing Zhang, Matthew T. Caudle, Lu Ma, Steven N. Ehrlich and Fudong Liu*



5827

Building monolayer $Ti_{0.91}O_2$ nanosheets to enhance hydrogen production for photocatalytic water splitting

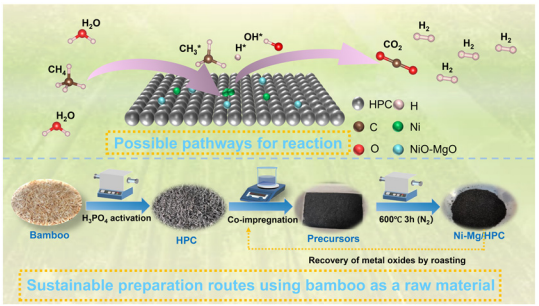
Canyi Qiu, Mukun Xu, Shitong Han,* Liuhan Guo, Hua Zhao, Jinni Shen, Wenxin Dai, Xuxu Wang, Zizhong Zhang* and Hailing Xi*



5837

Hierarchical porous carbon-supported bimetallic catalyst for enhanced low-temperature steam methane reforming

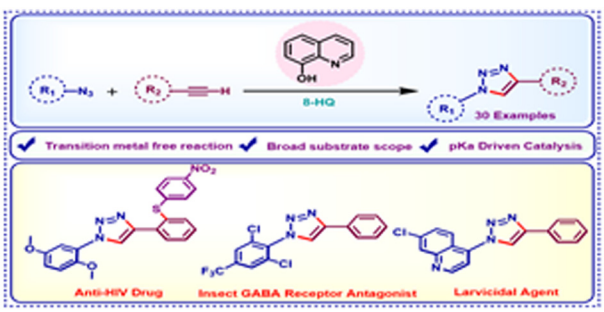
Yu-e Zhao, Jinxiao Li,* Ao Xu, Yulong Liu, Minghui Lian, Jing Zhang, Hexiang Zhong, Chunhua Yang, Rensheng Song and Liwei Pan*



5850

8-Hydroxyquinoline catalysed regioselective synthesis of 1,4-disubstituted-1,2,3-triazoles: realizing Cu-free click chemistry

Surbhi Bansal, Gopika R. Sreerekha, Ayanangshu Biswas, Alisha Sharma, Devika Girish, Debashis Adhikari* and Sanjay Singh*



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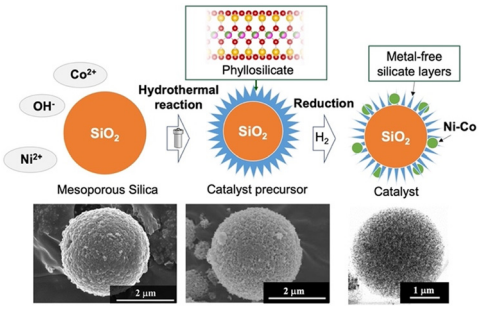
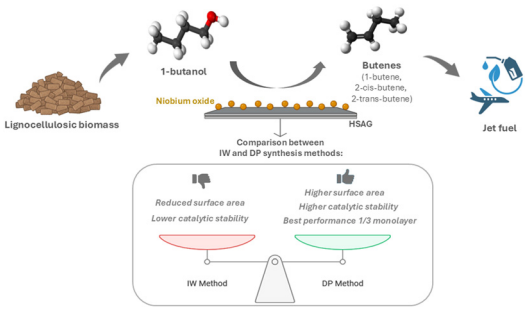


Fabrication of a highly stable Ni–Co bimetallic catalyst for the steam reforming of methane *via in situ* crystallization of phyllosilicate on porous spherical silica

Ryunosuke Nakamura, Hikari Minamisawa and Tomohiko Okada*

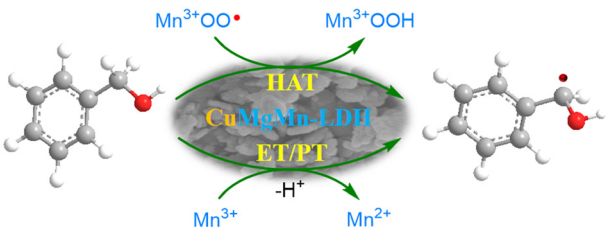
5864



Niobium oxide deposited on high surface area graphite as a stable catalyst in the 1-butanol dehydration reaction

J. M. Conesa,* A. Guerrero-Ruiz, I. Rodríguez-Ramos and M. V. Morales*

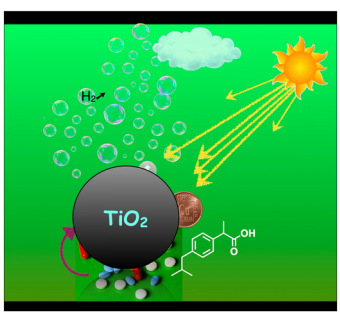
5876



Effects of doping metal on the catalytic performance of manganese-based layered double hydroxides in the aerobic oxidation of alcohols

Deqin Liang, Jiaqi Yan, Xiaojing Yin, Yu Wang, Jizhou Du, Junfeng Qian, Mingyang He* and Weiyou Zhou*

5886



Scavenging of photogenerated holes in TiO_2-based catalysts uniquely controls pollutant degradation and hydrogen formation under UVA or visible irradiation

Nelson Rutajoga, Valerie Velez and Juan C. Scaiano*

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PAPERS

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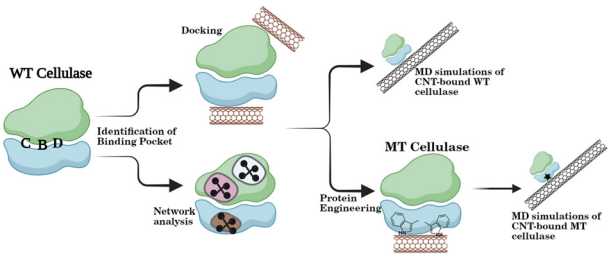
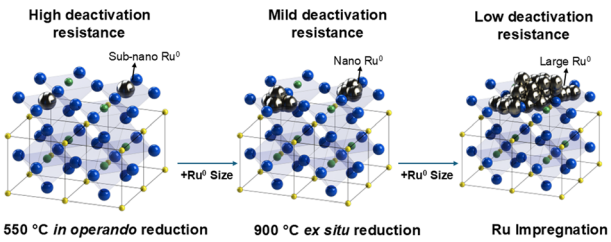
Protein engineering of cellulase enzymes for enhanced binding to single-walled carbon nanotubes: a computational approach to enzyme recycling in biofuel applications

Shubhashree Barik, Supriyo Mukherjee and Moumita Saharay*



5907

Enhanced ethanol reforming with catalytic active ruthenium species derived from solid solution in lanthanum chromite

Tamara S. Moraes, Victor B. Tinti, Daniel Z. de Florio, Andre S. Ferlauto, Fernando Piazzolla, Yohei Miura, David P. Dean, Hien N. Pham, Jeffrey T. Miller, Abhaya K. Datye and Fabio C. Fonseca*