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See Jihoon Shin, Sae Hume Park *et al.*, pp. 3732–3746.

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Inside cover
See Andrew J. Hunt *et al.*, pp. 3747–3757.

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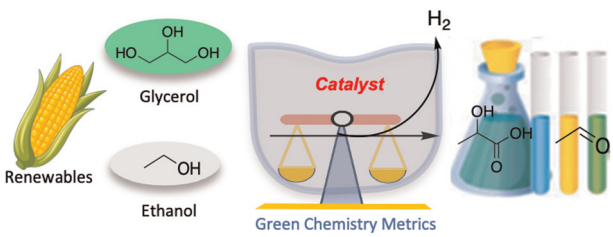
CRITICAL REVIEWS

3546

Homogeneous *vs.* heterogeneous catalysts for acceptorless dehydrogenation of biomass-derived glycerol and ethanol towards circular chemistry

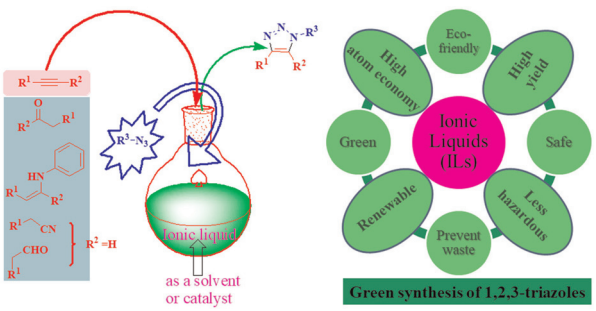
Kai Wang, Jonathan Horlyck, Nan An and Adelina Voutchkova-Kostal*



3565

Ionic liquids for the green synthesis of 1,2,3-triazoles: a systematic review

Aman Kumar, Vijay Kumar, Prashant Singh, Ram Kumar Tittal* and Kashmiri Lal*



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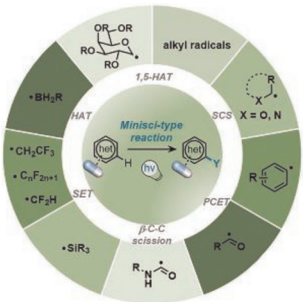
TUTORIAL REVIEWS

3595

Photocatalyzed Minisci-type reactions for late-stage functionalization of pharmaceutically relevant compounds

Xiaotong Zhang, Shuqi Li, Feng Qiu, Hwee Ting Ang,* Jie Wu* and Penghao Jia*



3627

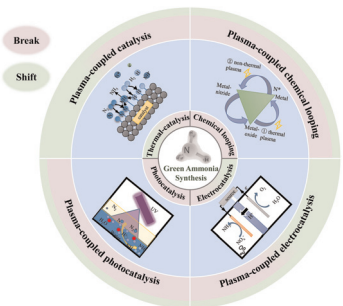
Deep eutectic solvents as an emerging green platform for the synthesis of functional materials

Yunping Ma, Yu Yang, Tie Li, Shahid Hussain and Maiyong Zhu*

3670

Strategies for avoiding the scaling relationship in ammonia synthesis with non-thermal plasma methods – the "shift" or "break" approach

Baiqiang Zhang,* Junhui Li, Hengfei Zuo, Yongqi Liang, Jia Wang, Yuhui Chen, Gang Chen, Kenji Kamiya, Nobusuke Kobayashi and Bo Wu*



PERSPECTIVES

3688

Advancing sustainable end-of-life strategies for photovoltaic modules with silicon reclamation for lithium-ion battery anodes

Owen Wang, Zhuowen Chen and Xiaotu Ma*

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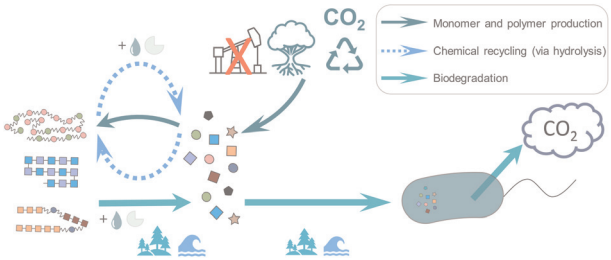
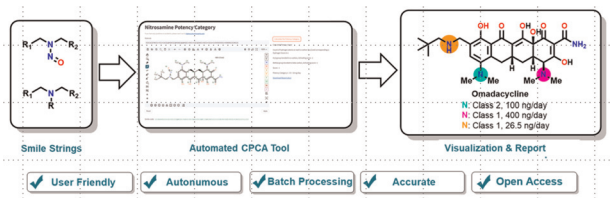


Polyester biodegradability: importance and potential for optimisation

Yue Wang, Robert-Jan van Putten, Albert Tietema, John R. Parsons and Gert-Jan M. Gruter*

COMMUNICATIONS

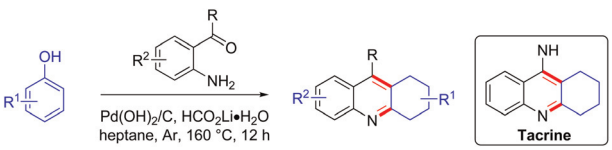
3717



An automated carcinogenic potency categorization approach for nitrosamine drug substance-related impurities

Jiazhou Zhu,* Yang Qu* and Ning Ye*

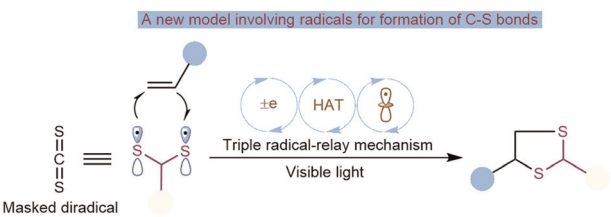
3722



Palladium-catalyzed conversion of phenols into tetrahydroacridines

Jianjin Yu, Renqin Zhan, Chao-Jun Li and Huiying Zeng*

3727



[3 + 2] radical sulfuration of alkenes by organic photocatalysis

Na Yang, Gefei Duan and Yunbo Zhu*

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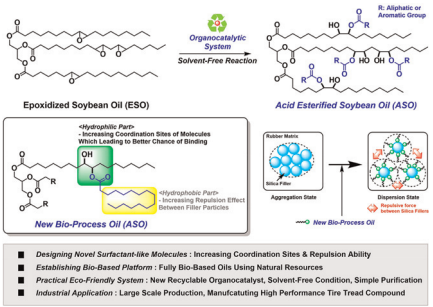
3732

Soybean oil derived-process oil prepared *via* recyclable organocatalysis for eco-friendly styrene–butadiene rubber composites

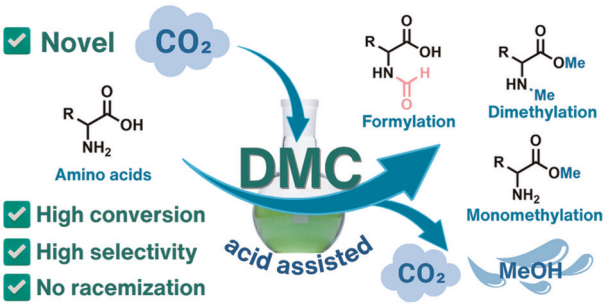
Geunho Kim, Woong Kim, Jeong Suk Yuk, Haemin Jeong, Hee Geom Jeon, Youngjae Yoo,* Jihoon Shin* and Sae Hume Park*



3747

A novel approach to amino acid synthesis: acid-assisted reactions with dimethyl carbonate for efficient *O*-methylated, *N*,*O*-methylated and *N*-formylated derivatives

Pattamabhorn Worsawat, Pakin Noppawan, Nontipa Supanchaiyamat, Himmy Wu, Con R. McElroy and Andrew J. Hunt*



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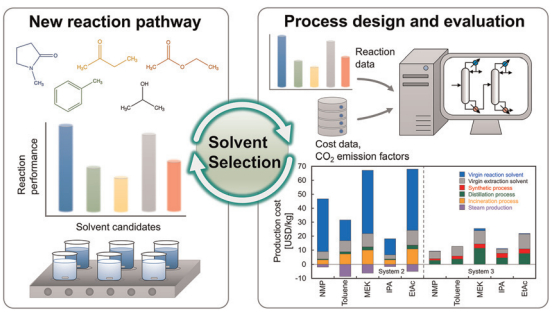
Solvent selection based on a conceptual process design by combining cost evaluation and life cycle assessments for developing new reaction pathways

Takehiro Yamaki,* Thuy T. H. Nguyen, Nobuo Hara, Satoshi Taniguchi and Sho Kataoka*



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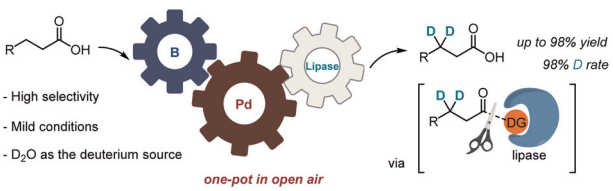
Chemoenzymatic β-specific methylene C(sp^3)–H deuteration of carboxylic acids

Xicheng Wang, Zhaohui Sun, Tao Li, Saima Perveen and Pengfei Li*



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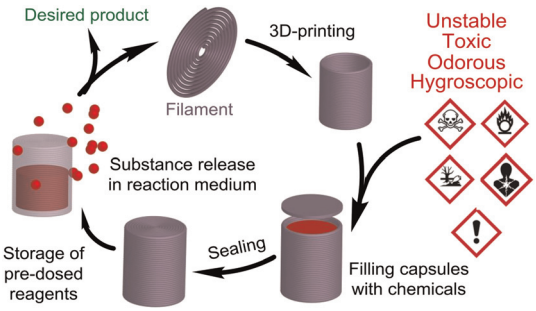
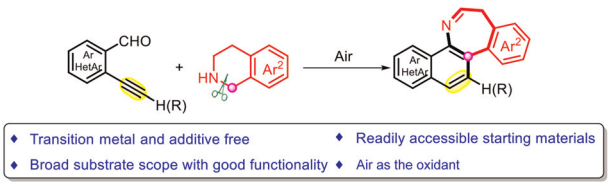


A 60-times faster digital-discovery-compatible reaction setup with enhanced safety for chemical applications

Andrey N. Lebedev, Konstantin S. Rodygin, Svetlana A. Vakhrusheva and Valentine P. Ananikov*

3786



Synthesis of the dibenzo[*b*,*d*]azepine skeleton *via* a catalyst-free ring expansion domino reaction

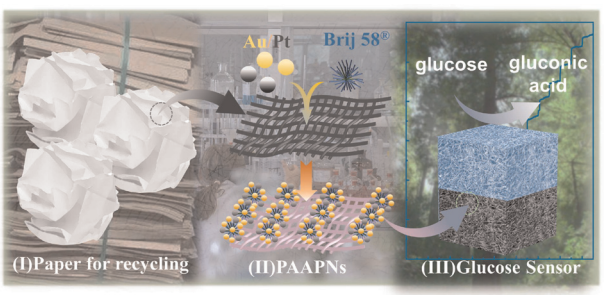
Tao Guo, Penghua Hu, Jiaxin Li, Yujia Zhou, Panke Zhang,* Yunhui Zhao* and Congjun Zhu*

3791

An integrative sustainability assessment of the Tsuji–Trost reaction simulating allylic amination under non-conventional (*vs.* conventional) conditions

Sangita Dattatray Shinde, Gargi Nikhil Vaidya, Shyam Kumar Lokhande, Anil Shaha, Ramesh Hiralal Choudhary and Dinesh Kumar*

3801



Used tissue paper as a 3D substrate for non-enzyme glucose sensors

Zhiyu Chen, Lei Li, Xuanyu Xiao, Yuxin Zhang, Jieyu Zhang, Qing Jiang,* Xuefeng Hu* and Yunbing Wang*

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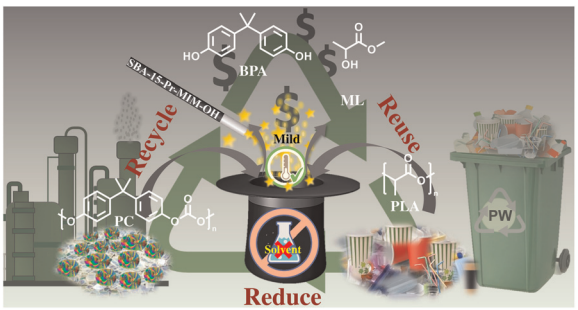
3814

Solvent-free chemical upcycling of poly(bisphenol A carbonate) and poly(lactic acid) plastic waste using SBA-15-functionalized basic ionic liquids

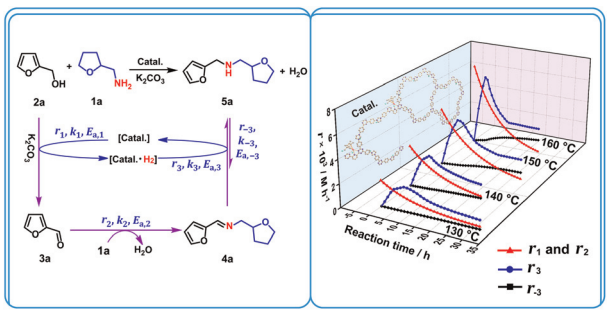
Arjun K. Manal, Garima Saini and Rajendra Srivastava*



3832

Construction of biomass-based amines *via* Ir-mediated *N*-alkylation: kinetic analysis

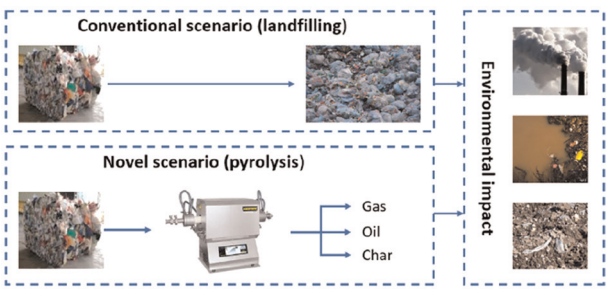
Meixiang Liang, Zhongmou Xu, Tianhao Zhou, Limin Chen* and Jinzhu Chen*



3853

Environmental impact of different scenarios for the pyrolysis of contaminated mixed plastic waste

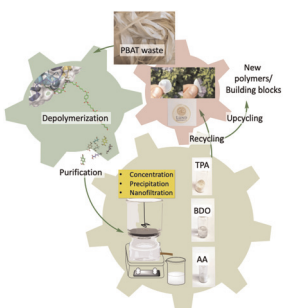
Guillermo Garcia-Garcia,* María Ángeles Martín-Lara,* Mónica Calero and Gabriel Blázquez



3863

Closing the loop for poly(butylene-adipate-*co*-terephthalate) recycling: depolymerization, monomers separation, and upcycling

Mohamed Ismail,* Adel Abouhmad, Niklas Warlin, Sang-Hyun Pyo, Oliver Englund Örn, Basel Al-Rudainy, Cecilia Tullberg, Baozhong Zhang and Rajni Hatti-Kaul*



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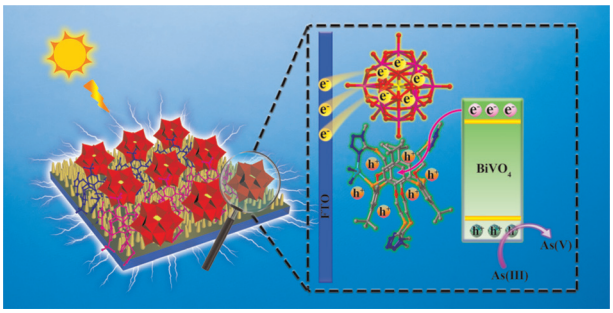
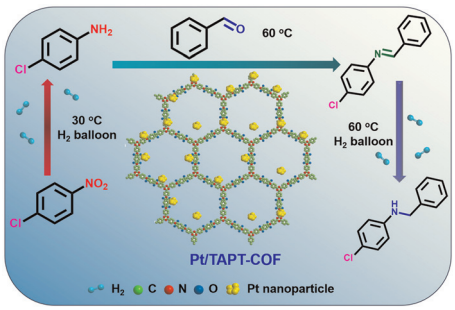


Highly efficient photoelectrocatalytic oxidation of arsenic(III) with a polyoxometalate-thiacalix[4] arene-based metal–organic complex-modified bismuth vanadate photoanode

Yuting Song, Jia-Yi Zhang, Jin Yang,* Tao Bo* and Jian-Fang Ma*

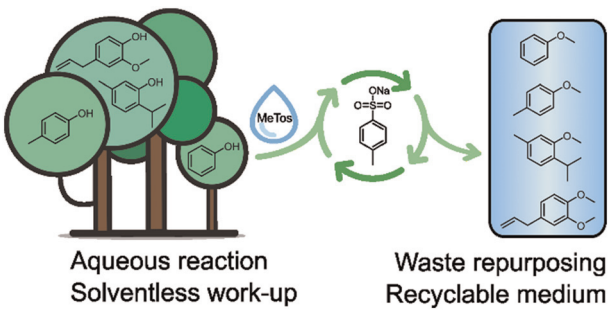
3884



Electron-rich Pt anchored on covalent triazine frameworks for the selective hydrogenation of halogenated nitrobenzenes

Mengmeng Gao, Jinfang Kou, Manhua Xu, Kun Yuan,* Mengyang Li* and Zhengping Dong*

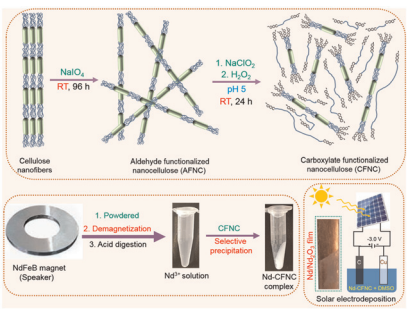
3903



Aqueous sodium tosylate: a sustainable medium for alkylations

Sem Bleus, Jeltzlin Semerel and Wim Dehaen*

3909



Neodymium recovery from NdFeB magnets: a sustainable, instantaneous, and cost-effective method

Sandeep Bose, Benilde Mizero and Parisa A. Ariya*

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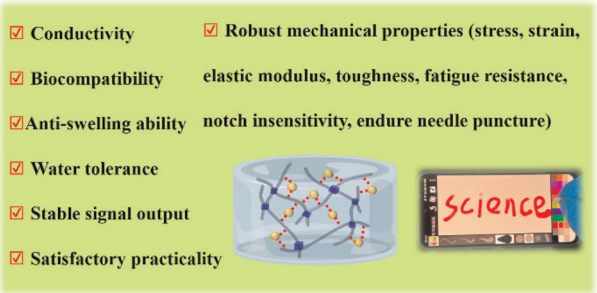
Robust hydrogel sensor with good mechanical properties, conductivity, anti-swelling ability, water tolerance and biocompatibility

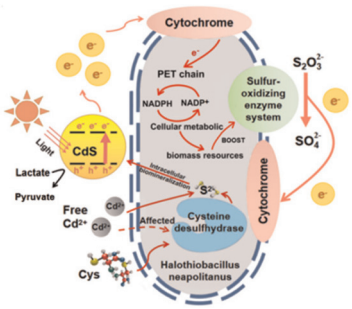
Airong Xu,* Tiantian Sun, Rukuan Liu,* Liuzemu Li, Yiming Gong and Zhihong Xiao



3940

Semiconductor biohybrids for enhanced bifunctional wastewater sulfur and heavy metal removal

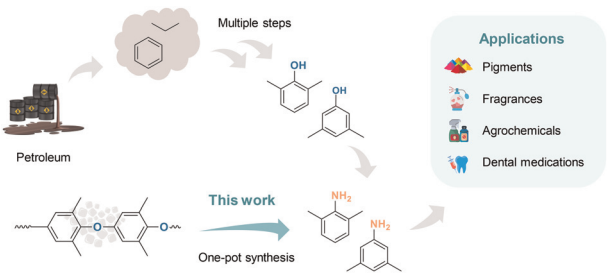
Yanju Zhang, Furui Fang, Xiaoxiao Qian, Liangchen Li, Zongli Huo, Jingjing Zhang, Dandan Dong, Chaofeng Huang,* JiaYuan Li, Yonghong Hu* and Li Mi*



3949

Direct amination of poly(*p*-phenylene oxide) to substituted anilines over bimetallic Pd–Ru catalysts

Phuc T. T. Nguyen, Gökalp Gözaydın, Jieran Ma, Bingqing Yao, Qian He and Ning Yan*



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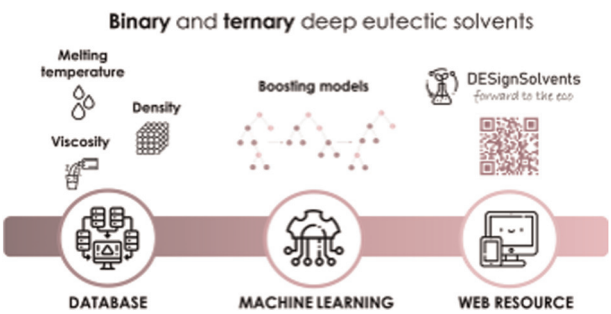
DESignSolvents: an open platform for the search and prediction of the physicochemical properties of deep eutectic solvents

Valeria Odegova, Anastasia Lavrinenko, Timur Rakhmanov, George Sysuev, Andrei Dmitrenko* and Vladimir Vinogradov*



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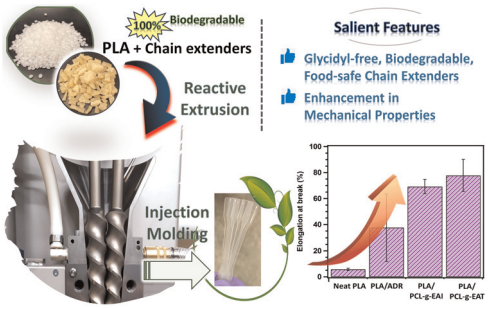
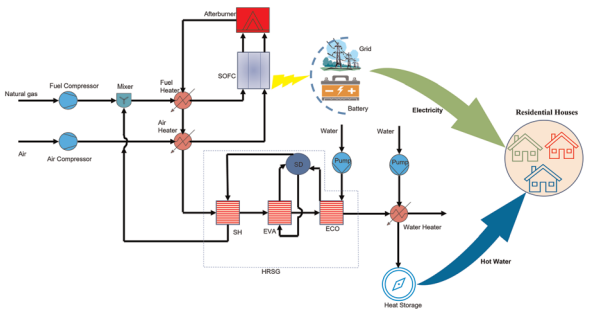


Food-safe glycidyl-free chain extenders for polylactides

Hazem M. Elkholy, Mohamed A. Abdelwahab, Muhammad Naveed, Khaled Abdelaziz and Muhammad Rabnawaz*

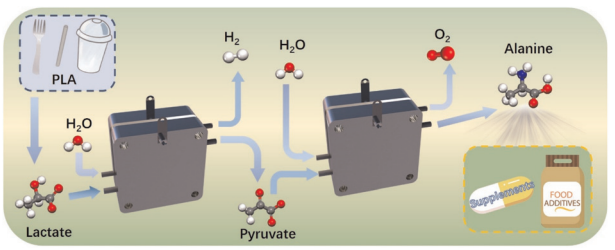
3979



Techno-economic analysis of solid oxide fuel cell-based energy systems for decarbonising residential power and heat in the United Kingdom

Dibyendu Roy, Samiran Samanta, Sumit Roy,* Andrew Smallbone and Anthony Paul Roskilly

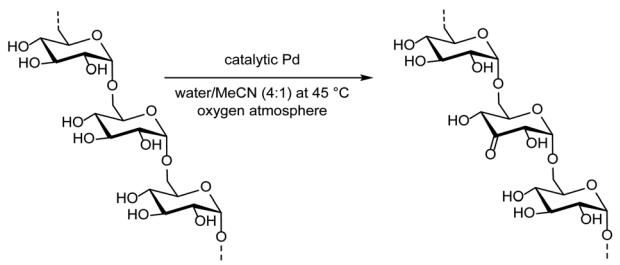
3995



Beyond biodegradation: upcycling of polylactic acid plastic waste into amino acids *via* cascade catalysis under mild conditions

Yingxin Ma, Xuyun Guo, Mengmeng Du, Sailei Kang, Weiliang Dong, Valeria Nicolosi, Zhongli Cui, Yu Zhang* and Bocheng Qiu*

4005



Regioselective palladium-catalysed aerobic oxidation of dextran and its use as a bio-based binder in paperboard coatings

Sarina C. Maßmann, Gerald A. Metselaar, Derk Jan van Dijken, Keimpe J. van den Berg, Martin D. Witte* and Adriaan J. Minnaard*

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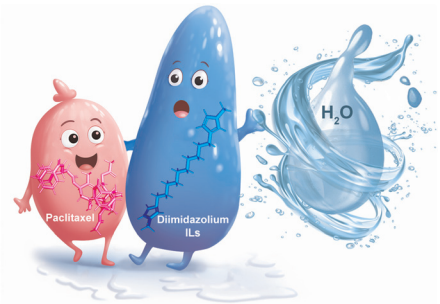
PAPERS

4013

Biocompatible diimidazolium based ionic liquid systems for enhancing the solubility of paclitaxel

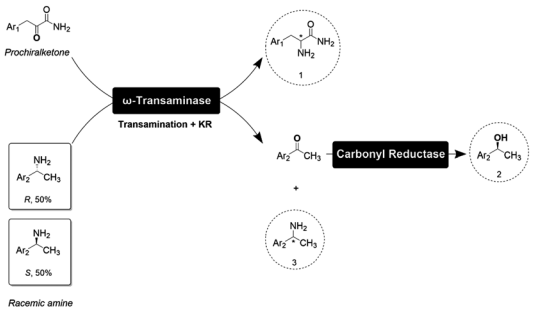
Yanhui Hu, Hua Yue, Shiqi Huang, Bingxi Song, Yuyuan Xing, Minmin Liu, Gongying Wang,* Yanyan Diao* and Suojiang Zhang*



4024

Biotransamination with racemic amines as amine donors: kill three birds with one stone through a dual-enzyme cascade

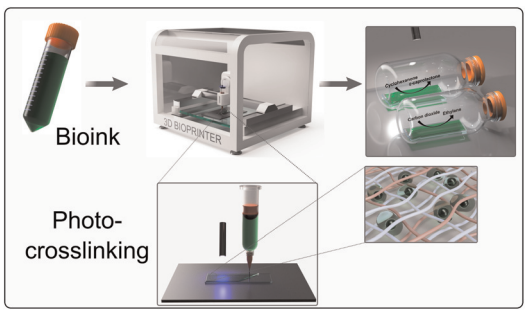
Kai Li, Mengjie Sun, Haoyu Jing, Jing Liu, Jun Gao and Bo Wang*



4032

Employing photocurable biopolymers to engineer photosynthetic 3D-printed living materials for production of chemicals

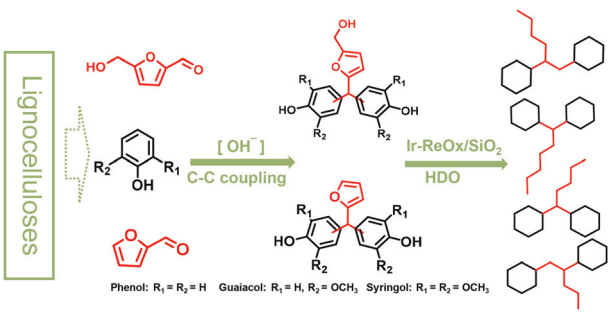
Gábor Szilveszter Tóth, Oskar Backman, Tiia Siivola, Wenyang Xu, Sergey Kosourov, Vilja Siitonen, Chunlin Xu and Yagut Allahverdiyeva*



4043

Selective production of bicyclic alkanes as high-density fuel additives by coupling lignocellulose-derived furanics and phenolics

Shumin Huang, Xiaolin Luo, Ji Li, Sibao Liu and Li Shuai*



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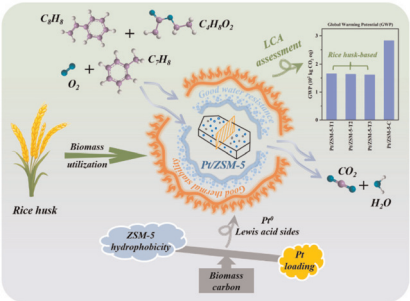
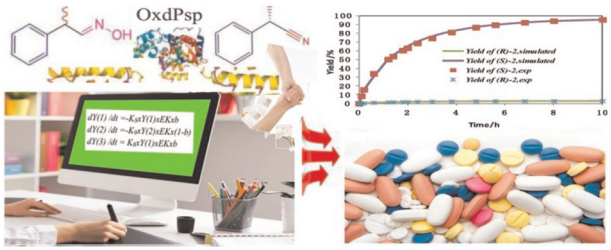


Pt anchored in the skeleton of rice husk-based ZSM-5 for excellent catalytic VOC oxidation: structure–activity relationship and environmental impact assessment

Wenxin Lan, Muping Shen, Yinye Chen, Kui Niu, Weiming Zhou,* Jing Xu, Baoquan Huang,* Hongjie Cai, Jiachang Zuo, Daifeng Lin, Yongjin Luo,* Qingrong Qian and Qinghua Chen

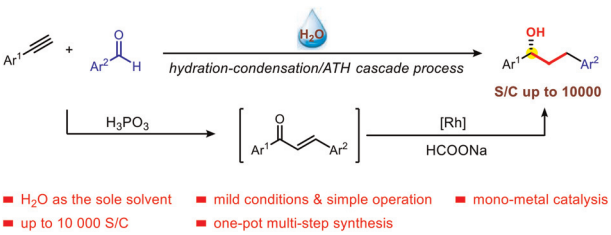
4065



Kinetic model of asymmetric dehydration of aldoxime catalyzed by immobilized OxdPsp in an organic solvent

Jiarui Chen, Yunlong Zhang, Xiaoying Zhang, Shiyang Wen, Min Qiao, Junhong Liu and Yuanyuan Zhang*

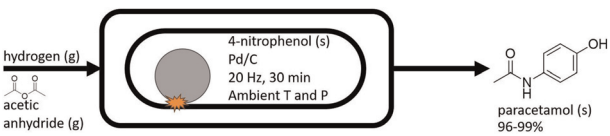
4074



Water-mediated one-pot multi-step synthesis of chiral 1,3-diarylpropan-1-ols by the asymmetric hydrofunctionalisation of simple alkynes

Pinke Yu, Qixing Liu, Linhong Zuo, Xumu Zhang,* Congcong Yin* and Haifeng Zhou*

4079



One-pot mechanochemical hydrogenation and acetylation of 4-nitrophenol to 4-aminophenol and paracetamol

Jimin Park, Jacob S. Maier, Caria Evans, Marta Hatzell, Stefan France, Carsten Sievers* and Andreas S. Bommarius*

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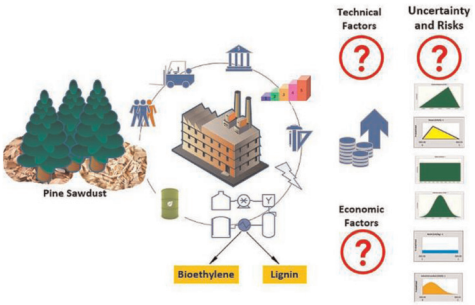
4092

Design of an integrated biorefinery for bioethylene production from industrial forest byproducts

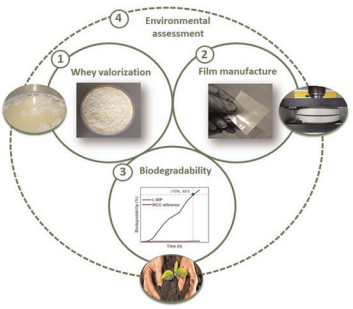
Rocio Elizabet Cardozo,* Nicolás Martín Clauser, Fernando Esteban Felissia, María Cristina Area and María Evangelina Vallejos



4103

Valorization of cheese whey: closing the loop from protein extraction to whey protein film composting

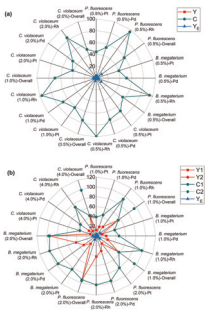
Maialen Uribarrena, Eric Rovira-Cal, Leire Urbina, Maria Jose Suárez, Enrique Aymerich, Pedro Guerrero, Koro de la Caba* and Alaitz Etxabide*



4112

Evaluation of green chemistry metrics for sustainable recycling of platinum group metals from spent automotive catalysts *via* bioleaching

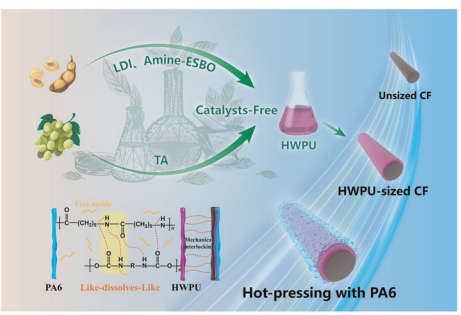
Salman Karim, Han Mei Saw and Yen-Peng Ting*



4127

Synthesis of a fully bio-based self-catalyzed hyperbranched waterborne polyurethane as a sizing agent for enhancing the interfacial properties of CF/PA6 composites

Shengtao Dai, Fei Yan, Siyu Zhang, Jiaming Guo, Lin Zhang, Yu Liu, Liu Liu* and Yuhui Ao*



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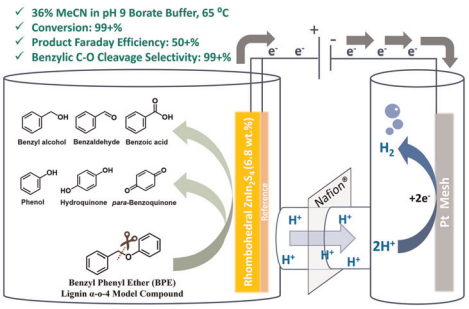
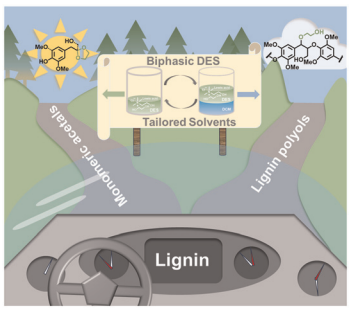
4135



Rhombohedral $ZnIn_2S_4$-catalysed anodic direct electrochemical oxidative cleavage of C–O bond in α-O-4 linkages in ambient conditions

Qi Zhu, Bo Gong, Shuquan Huang, Yangxin Jin, Shengqin Liu, Shan Shao, Yuwei Yang, Taren Cataldo, Nicholas M. Bedford and Jason Chun-Ho Lam*

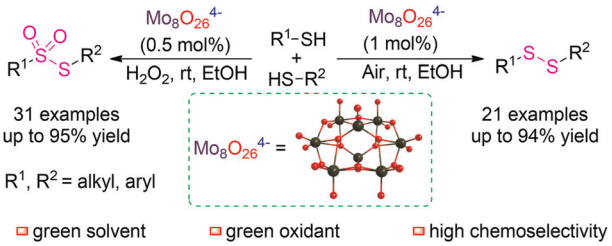
4151



Solvent-triggered directional lignin valorization towards monomeric acetals or lignin polyols

Xinyue Sun, Junjie Ni, Yuhan Lou, Peng Zhao, Yanyan Yu, Yilin Li, Qi Tang, Haipeng Yu* and Yongzhuang Liu*

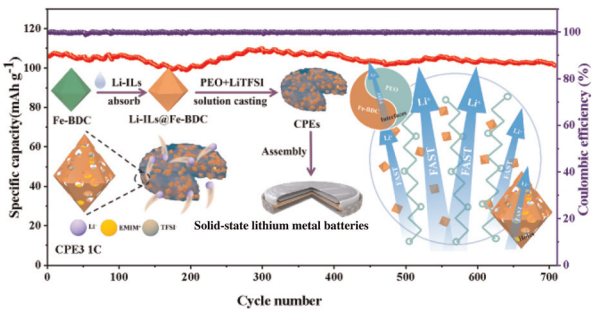
4161



Sustainable synthesis of thiosulfonates and disulfides by molybdenum-catalyzed selective oxidation of thiols

Zhibin Zhou, Hao Xu, Jiamin Ma, Xianghua Zeng* and Yongge Wei*

4168



Enhanced lithium-ion conductivity and interficial stability of Li-IL@Fe-BDC composite polymer electrolytes for solid-state lithium metal batteries

Liequan Liu, Zikang Gong, Chen Liu, Aiping Peng, Ze Zhang,* Ji Yu, Jianxin Cai and Zhenyu Yang*

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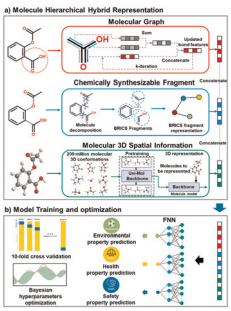
4181

An interpretable 3D multi-hierarchical representation-based deep neural network for environmental, health and safety properties prediction of organic solvents

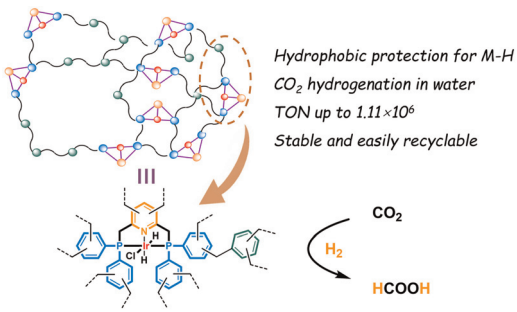
Jun Zhang, Qin Wang,* Yang Lei and Weifeng Shen*



4192

Highly efficient catalysts for CO_2 hydrogenation to formic acid in water catalyzed by hydrophobic porous polymers containing stable metal–hydride

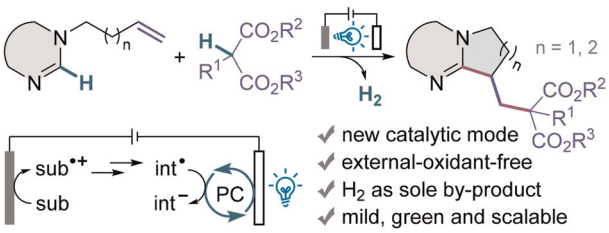
Wentao Ma, Wenjie Xiong,* Jinling Hu, Jiao Geng* and Xingbang Hu*



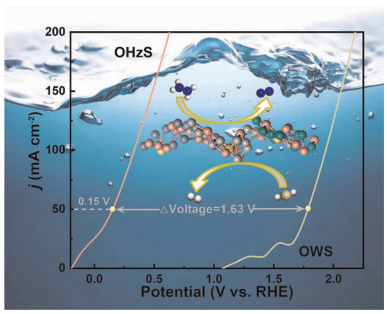
4199

Photoredox streamlines electrocatalysis: photoelectrosynthesis of polycyclic pyrimidin-4-ones through carbocyclization of unactivated alkenes with malonates

Minglin Tao, Qin Feng, Kaixing Gong, Xuege Yang, Lou Shi,* Qiaowen Chang* and Deqiang Liang*



4209

***In situ* electronic redistribution of NiCoZnP/NF heterostructure *via* Fe-doping for boosting hydrazine oxidation and hydrogen evolution**

Tongtong Shi, Bo Gao, Haoyu Meng, Yumo Fu, Delong Kong, Penghui Ren, Haiyang Fu and Zhongbao Feng*