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Discovery of 3,3*a*,4,5-tetrahydro-2*H*-benzo[*g*]indazole containing quinoxaline derivatives as novel EGFR/HER-2 dual inhibitors

Xi Zong, Jin Cai, Junqing Chen, Chunlong Sun, Lushen Li and Min Ji

RSC Adv., 2015,**5**, 24814-24823
DOI: 10.1039/C5RA02576A

A series of pyrazole–quinoxaline derivatives were synthesized and most of them exhibited potent affinity for EGFR or HER-2 kinase, as well as excellent antiproliferative activity, with compound **4l** being the most active.

Synthesis, characterization and antibacterial activities of *N*-*tert*-butoxycarbonyl-thiazolidine carboxylic acid

Zhong-Cheng Song, Gao-Yuan Ma and Hai-Liang Zhu

RSC Adv., 2015,**5**, 24824-24833
DOI: 10.1039/C4RA15284K

The mechanism of dynamic kinetic resolution, a nucleophilic substitution through an intramolecular hydrogen bonding by the formation of *N*-Boc-TCAs was proposed and a qualitative explanation was interpretated according to Curtin–Hammett principle.

De novo synthesis of functionalized 1,3-enynes and extended conjugated molecular systems

Maddali L. N. Rao, Priyabrata Dasgupta and Venneti N. Murty

RSC Adv., 2015,**5**, 24834-24845
DOI: 10.1039/C5RA01544H

Pd-catalyzed coupling of 1,3-dienyldibromides with triarylbismuths was demonstrated for the synthesis of a diverse range of 1,3-enynes.

Electrochemical exfoliation of graphite to produce graphene using tetrasodium pyrophosphate

M. K. Punith Kumar, Monika Nidhi and Chandan Srivastava

RSC Adv., 2015,**5**, 24846-24852
DOI: 10.1039/C5RA01304F

An electrochemical exfoliation based synthetic methodology to produce graphene is provided.

Gold nanoparticle decorated single walled carbon nanotube nanocomposite with synergistic peroxidase like activity for D-alanine detection

Waqar Haider, Akhtar Hayat, Yousuf Raza, Aqif Anwar Chaudhry, Ihtesham-Ur- Rehman and Jean Louis Marty

RSC Adv., 2015,**5**, 24853-24858
DOI: 10.1039/C5RA01258A

In this report, a gold nanoparticle decorated single walled carbon nanotube (SWCNTs) nanocomposite was shown to possess synergistic intrinsic peroxidase like activity and enhanced affinity towards H_2O_2 oxidation.

Polystyrene resin supported palladium(0) (Pd@PR) nanocomposite catalyzed synthesis of -aryl and ,-diaryl unsaturated scaffolds following tandem approaches

Arun K. Shil and Pralay Das

RSC Adv., 2015,**5**, 24859-24863
DOI: 10.1039/C5RA00228A

A one pot general tandem procedure is described for -aryl and ,-diaryl alkenes synthesis following an alternative to the classical approaches by using aryl aldehyde as one of the starting materials.

A polymerized ionic liquid functionalized cathode catalyst support for a proton exchange membrane CO_2 conversion cell

P. Tamilarasan and S. Ramaprabhu

RSC Adv., 2015,**5**, 24864-24871
DOI: 10.1039/C5RA03002A

This present study aims at the efficient conversion of CO_2 to formic acid using a proton exchange membrane cell by selective functionalization of a cathode catalyst support.

Synthesis of $CaCO_3$@C yolk–shell particles for CO_2 adsorption

Yash Boyjoo, Kelly Merigot, Jean-François Lamonier, Vishnu K. Pareek, Moses O. Tade and Jian Liu

RSC Adv., 2015,**5**, 24872-24876
DOI: 10.1039/C5RA02427G

This paper reports the first example of the synthesis of $CaCO_3$@C yolk–shell particles and their application in CO_2 adsorption.

A new platinum(II) complex for bioimaging applications

Verasundaram M. Manikandamathavan, Natarajan Duraipandy, Manikantan S. Kiran, Vaidyanathan G. Vaidyanathan and Balachandran U. Nair

RSC Adv., 2015,**5**, 24877-24885
DOI: 10.1039/C5RA00002E

A new Pt(II) complex bearing terpyridine derivative exhibit specificity towards nuclear DNA. The staining ability has been explored in cell imaging as well as in gel electrophoresis an alternative to highly mutagenic ethidium bromide.

Tuning the chemistry of graphene oxides by a sonochemical approach: application of adsorption properties

Yubing Sun, Shubin Yang, Congcong Ding, Zhongxiu Jin and Wencai Cheng

RSC Adv., 2015,**5**, 24886-24892
DOI: 10.1039/C5RA02021B

The change in the chemical properties of graphene oxides (GOs) can be tuned by the sonochemical approach.

Synthesis of conjugated microporous polymer nanotubes for polymer composites

Zhentao Xiang, Hanxue Sun, Zhaoqi Zhu, Weidong Liang, Baoping Yang and An Li

RSC Adv., 2015,**5**, 24893-24898
DOI: 10.1039/C5RA00437C

Tubular conjugated microporous polymers were synthesized and used as fillers for preparation of polymer composites with enhanced properties.

Adsorption of gaseous elemental mercury with activated carbon impregnated with ferric chloride

Xue Qian Wang, Ping Wang, Ping Ning, Yi Xing Ma, Fei Wang, Xiao Long Guo and Yi Lan

RSC Adv., 2015,**5**, 24899-24907
DOI: 10.1039/C5RA01011J

Fe-based modified activated carbon prepared by impregnation was used for adsorbents in Hg^0 purification.

Band engineering *via* biaxial strain for enhanced thermoelectric performance in stannite-type $Cu_2ZnSnSe_4$

Daifeng Zou, Guozheng Nie, Yu Li, Ying Xu, Jianguo Lin, Hairong Zheng and Jiangyu Li

RSC Adv., 2015,**5**, 24908-24914
DOI: 10.1039/C5RA00477B

The enhancement of the thermoelectric properties of stannite-type $Cu_2ZnSnSe_4$ under biaxial strain can be ascribed to band convergence of the valence bands near the Fermi level.

Synthesis of ferrocene-containing six-membered cyclic ureas *via* -ferrocenyl carbocations

Aleksandra Mini, Dragana Stevanovi, Ivan Damljanovi, Anka Pejovi, Mirjana Vukievi, Goran A. Bogdanovi, Niko S. Radulovi and Rastko D. Vukievi

RSC Adv., 2015,**5**, 24915-24919
DOI: 10.1039/C5RA01383F

A convenient method for the synthesis of ferrocene-containing six membered cyclic ureas was developed.

Adsorption of chlorinated phenols on multiwalled carbon nanotubes

Marijana Kragulj, Jelena Trikovi, Ákos Kukovecz, Branislav Jovi, Jelena Molnar, Sran Ronevi, Zoltán Kónya and Božo Dalmacija

RSC Adv., 2015,**5**, 24920-24929
DOI: 10.1039/C5RA03395K

This work studies the adsorption of four chlorinated phenols (2,4-dichlorophenol, 2,4,6-trichlorophenol, 2,3,4,5-tetrachlorophenol and pentachlorophenol) in aqueous solutions on multiwalled carbon nanotubes (MWCNT).

Synthesis and characterization of high-purity, single phase hexagonal Bi_2Te_3 nanostructures

L. Giri, G. Mallick, A. C. Jackson, M. H. Griep and S. P. Karna

RSC Adv., 2015,**5**, 24930-24935
DOI: 10.1039/C5RA02303C

Schematic solvothermal synthesis of Bi_2Te_3 (a) producing Bi_2Te_3 hexagonal nanoplates (TEM) (b) which was converted into pellet (c). The electrical characterization (d) of the Bi_2Te_3 pellet surface showed significantly high current (more than 100 times) than through the pellet.

Efficient and convenient oxidation of aldehydes and ketones to carboxylic acids and esters with H_2O_2 catalyzed by $Co_4HP_2Mo_{15}V_3O_{62}$ in ionic liquid [TEBSA][BF_4]

Yu-Lin Hu, De-Jiang Li and Dong-Sheng Li

RSC Adv., 2015,**5**, 24936-24943
DOI: 10.1039/C5RA02234G

A simple, efficient, and eco-friendly procedure for the oxidation of aldehydes and ketones to carboxylic acids and esters with H_2O_2 catalyzed by $Co_4HP_2Mo_{15}V_3O_{62}$ in ionic liquid [TEBSA][BF_4] has been developed.

Coupling with a narrow-band-gap semiconductor for enhancement of visible-light photocatalytic activity: preparation of Bi_2S_3/g-C_3N_4 and application for degradation of RhB

Xinshan Rong, Fengxian Qiu, Jie Yan, Hao Zhao, Xiaolu Zhu and Dongya Yang

RSC Adv., 2015,**5**, 24944-24952
DOI: 10.1039/C4RA15715J

Bi_2S_3 was synthesized on the surface of g-C_3N_4 to narrow the band gap of the catalyst for a visible-light response.

Silver nanowire/polyimide composite transparent electrodes for reliable flexible polymer solar cells operating at high and ultra-low temperature

Xiaoyang Guo, Xingyuan Liu, Jinsong Luo, Zhihong Gan, Zhong Meng and Nan Zhang

RSC Adv., 2015,**5**, 24953-24959
DOI: 10.1039/C5RA00403A

Silver nanowire and polyimide composite transparent electrodes are produced that show excellent properties under ultralow and high temperatures.

Synthesis and biological evaluation of novel 1,2-naphthoquinones possessing tetrazolo[1,5-*a*]pyrimidine scaffolds as potent antitumor agents

Liqiang Wu

RSC Adv., 2015,**5**, 24960-24965
DOI: 10.1039/C5RA00711A

A series of novel 1,2-naphthoquinones possessing tetrazolo[1,5-*a*]pyrimidine scaffolds were synthesized and all the compounds exhibited excellent antitumor activities.

Titanium-induced structure modification for thermal stability enhancement of a GeTeTi phase change material

Xinglong Ji, Liangcai Wu, Min Zhu, Feng Rao, Zhitang Song, Zhigao Hu, Shuang Guo, Ling Xu, Xilin Zhou and Songlin Feng

RSC Adv., 2015,**5**, 24966-24974
DOI: 10.1039/C4RA11504J

For GTT, just with a small Ti fraction, the amorphous stability is greatly enhanced, and the grain size decreases one order of magnitude. This can be attributed to the structure modification induced by the Ti-center units.

Preparation and characterization of KGM-*g*-St/BA fibers and core/shell PCL/KGM-*g*-St/BA fibers

Jiuya Zhu, Xiaoyan Lin, Zhongqing Zhang and Xuegang Luo

RSC Adv., 2015,**5**, 24975-24983
DOI: 10.1039/C4RA16170J

KGM-*g*-St/BA copolymer was synthesized *via* free-radical polymerization, KGM-*g*-St/BA fibers and KGM-*g*-St/BA (shell)/PCL (core) fibers were prepared by electrospinning.

Role of pretreatment with acid and base on the distribution of the products obtained *via* lignocellulosic biomass pyrolysis

Xinde Wang, Shuai Leng, Jiaqi Bai, Hu Zhou, Xing Zhong, Guilin Zhuang and Jianguo Wang

RSC Adv., 2015,**5**, 24984-24989
DOI: 10.1039/C4RA15426F

Analysis of chemicals distribution in pyrolysis liquid following different content of acid and base in pretreatment.

Metallization of electrospun PAN nanofibers *via* electroless gold plating

Ramdayal Yadav and K. Balasubramanian

RSC Adv., 2015,**5**, 24990-24996
DOI: 10.1039/C5RA03531G

An electroless gold plating process was investigated for the metallization of an electropun PAN fibre by utilizing a non-cyanide based gold complex *i.e.* gold thiosulfate.

Dihydropyrazoles containing morpholine: design, synthesis and bioassay testing as potent antimicrobial agents

Peng-Fei Wang, Han-Yue Qiu, Jun-Ting Ma, Xiao-Qiang Yan, Hai-Bin Gong, Zhong-Chang Wang and Hai-Liang Zhu

RSC Adv., 2015,**5**, 24997-25005
DOI: 10.1039/C4RA15201H

A series of dihydropyrazole derivatives were designed and synthesized as antimicrobial agents. In both docking simulation and bioassay tests, these compounds showed potent S. aureus TyrRS enzyme inhibition activity.

Structure of fully asymmetric mixed electrolytes around a charged nanoparticle: a density functional and simulation investigation

Chandra N. Patra

RSC Adv., 2015,**5**, 25006-25013
DOI: 10.1039/C5RA00643K

A systematic study on the structure of mixed electrolytes with arbitrary size and charge asymmetry around a charged nanoparticle is carried out using density functional theory and Monte Carlo simulation.

Modified biopolymer-dextrin based crosslinked hydrogels: application in controlled drug delivery

Dipankar Das and Sagar Pal

RSC Adv., 2015,**5**, 25014-25050
DOI: 10.1039/C4RA16103C

This review describes hydrogels and their classifications along with the synthesis and properties of biopolymer-dextrin based crosslinked hydrogels towards potential application in controlled drug delivery.

Investigation of antiglycation activity of isoprenaline

Yogesh M. Kolekar, Garikapati Vannuruswamy, Sneha B. Bansode, Santhakumari B, Hirekodathakallu V. Thulasiram and Mahesh J. Kulkarni

RSC Adv., 2015,**5**, 25051-25058
DOI: 10.1039/C5RA01723H

Isoprenaline reduces the advanced glycation end products and may be suitable candidate for the treatment of glycation associated diseases.

Photocatalytic degradation of imidacloprid in soil: application of response surface methodology for the optimization of parameters

Teena Sharma, Amrit Pal Toor and Anita Rajor

RSC Adv., 2015,**5**, 25059-25065
DOI: 10.1039/C5RA02224J

The photocatalytic mineralization of imidacloprid (IMI) in soil to inorganic ions and the formation of various intermediates using TiO_2 as the photocatalyst have been investigated under UV light.

An ‘all in one’ approach for simultaneous chemotherapeutic, photothermal and magnetic hyperthermia mediated by hybrid magnetic nanoparticles

Sivakumar Balasubramanian, Aswathy Ravindran Girija, Yutaka Nagaoka, Takahiro Fukuda, Seiki Iwai, Venugopal Kizhikkilot, Kazunori Kato, Toru Maekawa and Sakthikumar Dasappan Nair

RSC Adv., 2015,**5**, 25066-25078
DOI: 10.1039/C5RA00168D

Trimodal (chemo-photothermal and MHT) lethality imparted by triple targeted dual drug loaded hybrid MNPs.

Molecular engineering of quinoxaline dyes toward more efficient sensitizers for dye-sensitized solar cells

Li-Na Yang, Shi-Cheng Li, Ze-Sheng Li and Quan-Song Li

RSC Adv., 2015,**5**, 25079-25088
DOI: 10.1039/C5RA00587F

N-annulated perylene-containing quinoxaline sensitizer (NIQ4) displays remarkable performance in light harvesting, electron injection, and dye regeneration.

Fabrication of molds for PDMS microfluidic devices by laser swelling of PMMA

Ednan Joanni, Jonnas Peressinotto, Patricia Silva Domingues, Grazielle de Oliveira Setti and Dosil Pereira de Jesus

RSC Adv., 2015,**5**, 25089-25096
DOI: 10.1039/C5RA03122B

Swelling of polymers upon the action of a laser allows “direct drawing” of molds for PDMS microfluidic devices having very smooth surfaces and variable channel depths.

Removal of heavy metals from water through armchair carbon and boron nitride nanotubes: a computer simulation study

Jafar Azamat, Alireza Khataee and Sang Woo Joo

RSC Adv., 2015,**5**, 25097-25104
DOI: 10.1039/C4RA17048B

Number of heavy metals permeation from the (7,7) CNT and the (7,7) BNNT in the applied voltages.

Selective cell elimination *in vitro* and *in vivo* from tissues and tumors using antibodies conjugated with a near infrared phthalocyanine

Kazuhide Sato, Takahito Nakajima, Peter L. Choyke and Hisataka Kobayashi

RSC Adv., 2015,**5**, 25105-25114
DOI: 10.1039/C4RA13835J

Before and after eliminating EGFR+ cells.

Nano -Fe_2O_3-supported fluoroboric acid: a novel magnetically recyclable catalyst for the synthesis of 12-substituted-benzo[*h*][1,3]dioxolo[4,5-*b*]-acridine-10,11-diones as potent antitumor agents

Xiaojuan Yang, Chong Zhang and Liqiang Wu

RSC Adv., 2015,**5**, 25115-25124
DOI: 10.1039/C5RA00887E

Nano -Fe_2O_3-supported fluoroboric acid was synthesized as a novel magnetic catalyst, and was used for the efficient synthesis of benzoacridinediones.

A sensitive and efficient trifluoroacetyl-based aromatic fluorescent probe for organic amine vapour detection

Junjun Yao, Yanyan Fu, Wei Xu, Tianchi Fan, Qingguo He, Defeng Zhu, Huimin Cao and Jiangong Cheng

RSC Adv., 2015,**5**, 25125-25131
DOI: 10.1039/C5RA00363F

Highly reversible, sensitive and efficient trifluoroacetyl-substituted fluorescent probes were designed for discriminating multiple trace organic amine vapours.

Typical and atypical domain combinations in human protein kinases: functions, disease causing mutations and conservation in other primates

Ramaswamy Rakshambikai, Malini Manoharan, Mutharasu Gnanavel and Narayanaswamy Srinivasan

RSC Adv., 2015,**5**, 25132-25148
DOI: 10.1039/C4RA11685B

A twist in the evolution of human kinases resulting in kinases with hybrid and rogue properties.

Concentration-dependent effective attractions between PEGylated nanoparticles

Malin Zackrisson Oskolkova, Anna Stradner, Jeanette Ulama and Johan Bergenholtz

RSC Adv., 2015,**5**, 25149-25155
DOI: 10.1039/C5RA00731C

Effective attractions between colloidal particles bearing a grafted PEG layer in water have been studied and, from a quantitative SANS analysis, are found to be concentration dependent.

Cost effective urea combustion derived mesoporous-Li_2MnSiO_4 as a novel material for supercapacitors

Prerna Chaturvedi, Amit Kumar, Anjan Sil and Yogesh Sharma

RSC Adv., 2015,**5**, 25156-25163
DOI: 10.1039/C5RA02207J

Mesoporous-Li_2MnSiO_4 (LMS) having a surface area of 35 (±2) m^2 g^1 is produced using a very simple, fast and cost effective urea combustion method for the first time and examined as novel material for supercapacitor.

Microorganism-based monodisperse microcapsules: encapsulation of the fungicide tebuconazole and its controlled release properties

Bo Zhang, Teng Zhang, Quanxi Wang and Tianrui Ren

RSC Adv., 2015,**5**, 25164-25170
DOI: 10.1039/C5RA01629K

A controlled release system was prepared, it based on UF modified PCC cells in which TEB are loaded into cells. It can control the drug release rate, depress the initial “burst effect”, and was efficacious in controlling wheat powdery mildew.

New insights into reinforcement mechanism of nanoclay-filled isoprene rubber during uniaxial deformation by *in situ* synchrotron X-ray diffraction

Xuan Fu, Guangsu Huang, Zhengtian Xie and Wang Xing

RSC Adv., 2015,**5**, 25171-25182
DOI: 10.1039/C5RA02123E

The existence of a denser network domain formed by incorporation of filler and its vital role in determining the strain-induced crystallization behavior of nanocomposites is proved by *in situ* synchrotron X-ray diffraction characterization.

Density functional theory study on the reaction of triazol-3-one with nitronium: direct nitration *versus* acidic group-induced nitration

Kuan Wang, Jian-Gang Chen, Bozhou Wang, Fengyi Liu, Zhao-Tie Liu, Zhong-Wen Liu, Wenliang Wang, Jinqiang Jiang, Zhengping Hao and Jian Lu

RSC Adv., 2015,**5**, 25183-25191
DOI: 10.1039/C4RA16718J

Herein, an unexpected induction effect derived from the coexisted acid group (NO_3 and/or HSO_4) was proposed. The impact of the induction effect and the resulted enhanced catalytic effect on the nitration of TO was systematically demonstrated.

Enhanced photovoltaic performance of inverted polymer solar cells by incorporating graphene nanosheet/AgNPs nanohybrids

Yu-An Su, Wei-Chen Lin, Hsing-Ju Wang, Wan-Hua Lee, Rong-Ho Lee, Shenghong A. Dai, Chi-Fa Hsieh and Ru-Jong Jeng

RSC Adv., 2015,**5**, 25192-25203
DOI: 10.1039/C4RA16855K

A linear-dendritic block copolymer functionalized exfoliated graphene nanosheets/silver nanoparticles was prepared for using as the interfacial layer between the electron-selective layer and photoactive layer in an inverted polymer solar cell.

Micro-wheels composed of self-assembled tungsten oxide nanorods for highly sensitive detection of low level toxic chlorine gas

Pham Van Tong, Nguyen Duc Hoa, Nguyen Van Duy and Nguyen Van Hieu

RSC Adv., 2015,**5**, 25204-25207
DOI: 10.1039/C5RA00916B

Gas nanosensor based on micro-wheels composed of self-assembled tungsten oxide nanorods exhibited excellent sensing performance to ppb level Cl_2.

Influence of matrix modulus on the mechanical and interfacial properties of carbon fiber filament wound composites

Qingjie Zhang, Shengbiao Liang, Gang Sui and Xiaoping Yang

RSC Adv., 2015,**5**, 25208-25214
DOI: 10.1039/C5RA00098J

High modulus resin matrix is proposed to be an essential prerequisite to carbon fiber filament wound composites with excellent mechanical and interfacial properties.

Preparation of diverse flower-like ZnO nanoaggregates for dye-sensitized solar cells

Liping Lin, Xiao Peng, Si Chen, Bao Zhang and Yaqing Feng

RSC Adv., 2015,**5**, 25215-25221
DOI: 10.1039/C5RA01938A

Three-dimensional (3D) ZnO materials with different morphologies were fabricated and the mechanism for the formation of these ZnO nanoaggregates is proposed.

I_2-mediated sulfonylation and Na_2SO_3-mediated deacylation: a general protocol for the synthesis of -keto sulfones and -dicarbonyl sulfones

Wen-Chao Gao, Jin-Jin Zhao, Fei Hu, Hong-Hong Chang, Xing Li and Wen-Long Wei

RSC Adv., 2015,**5**, 25222-25228
DOI: 10.1039/C5RA03826J

A general method for constructing both -keto sulfones and -dicarbonyl sulfones has been developed.

Naked-eye-based selective detection of pyrophosphate with a Zn^{2+} complex in aqueous solution and electrospun nanofibers

Zhanxian Li, Wenying Zhang, Xingjiang Liu, Chunxia Liu, Mingming Yu and Liuhe Wei

RSC Adv., 2015,**5**, 25229-25235
DOI: 10.1039/C4RA16742B

Based on keto–enol transformation process, a zinc complex as a naked-eye-based chemosensor for pyrophosphate in aqueous solution and electrospun nanofibers has been developed.

Well-dispersed magnetic iron oxide nanocrystals on sepiolite nanofibers for arsenic removal

Na Tian, Xike Tian, Longlong Ma, Chao Yang, Yanxin Wang, Zhenyang Wang and Lide Zhang

RSC Adv., 2015,**5**, 25236-25243
DOI: 10.1039/C5RA01592H

A novel nanostructure composed of magnetic iron oxide anchored on sepiolites with excellent arsenic adsorption performance has been developed.

Graphene/cotton composite fabrics as flexible electrode materials for electrochemical capacitors

Ling-Li Xu, Mei-Xia Guo, Si Liu and Shao-Wei Bian

RSC Adv., 2015,**5**, 25244-25249
DOI: 10.1039/C4RA16063K

Graphene/cotton composite fabrics were successfully synthesized *via* a facile “dipping and drying” process followed by a $NaBH_4$ reduction method.

Manganese oxide nanostructures: low-temperature selective synthesis and thermal conversion

Leilei Lan, Guangrui Gu, Quanjun Li, Huafang Zhang, Ke Xu, Bo Liu and Bingbing Liu

RSC Adv., 2015,**5**, 25250-25257
DOI: 10.1039/C5RA02241J

-MnOOH nanorods, -MnO_2 nanosheets, -Mn_2O_3 nanocubes, and Mn_3O_4 nanoparticles were selectively prepared *via* a facile, high-yield and low-temperature reduction route.

Template GNL-assisted synthesis of porous $Li_{1.2}Mn_{0.534}Ni_{0.133}Co_{0.133}O_2$: towards high performance cathodes for lithium ion batteries

Yanling Huang, Xianhua Hou, Shaomeng Ma, Xiaoli Zou, Yuping Wu, Shejun Hu, Zongping Shao and Xiang Liu

RSC Adv., 2015,**5**, 25258-25265
DOI: 10.1039/C5RA00845J

A high performance cathode of porous $Li_{1.2}Mn_{0.534}Ni_{0.133}Co_{0.133}O_2$ for lithium ion batteries synthesized by a GNL-template.

Polarization enhanced multi-grain-boundary dendritic micro–nano structure -Fe for electromagnetic absorption applications: synthesis and characterization

Zhenxing Yu, Zhongping Yao, Na Zhang and Zhaohua Jiang

RSC Adv., 2015,**5**, 25266-25272
DOI: 10.1039/C5RA01665G

Multi-grain-boundary hierarchical dendritic micro–nano structure -Fe was synthesized under the suppression effect of rare earth ions. These abundant grain boundaries contribute to the dramatic enhancement of electromagnetic absorption performance.

Synthesis, crystal structure and catalytic activity of the guanidinium cation directed nickel(II)-containing open Wells–Dawson 19-tungstodiarsenate(III) $[\{Ni(H_2O)_4\}_2\{Na(H_2O)\}As_2W_{19}O_{67}(H_2O)]^{9-}$

Mukesh Kumar Saini, Rakesh Gupta, Surendra Singh and Firasat Hussain

RSC Adv., 2015,**5**, 25273-25278
DOI: 10.1039/C5RA01426C

Guanidinium directed open Wells–Dawson type $[\{Ni(H_2O)_4\}_2\{Na(H_2O)\}As_2W_{19}O_{67}(H_2O)]^{9}$ polyanion **1** has been synthesized on reacting nickel chloride and trilacunary $Na_9[B\text{--}AsW_9O_{33}]$ in aqueous solution (pH 5.8), in presence of pyridine-2,6-dicarboxylic acid.

Aerobic granular sludge-derived activated carbon: mineral acid modification and superior dye adsorption capacity

Ge Zhang, Li Shi, Yongfang Zhang, Dong Wei, Tao Yan, Qin Wei and Bin Du

RSC Adv., 2015,**5**, 25279-25286
DOI: 10.1039/C4RA15216F

A novel aerobic granular sludge-derived activated carbon (AC) was prepared by a zinc chloride activation method and further modified by mineral acid (nitric acid (NA) and sulfuric acid (SA)).

Halogen-free ionic liquids: effect of chelated orthoborate anion structure on their lubrication properties

Rashi Gusain and Om P. Khatri

RSC Adv., 2015,**5**, 25287-25294
DOI: 10.1039/C5RA03092G

The chelated orthoborate anions based ammonium ionic liquids are developed for non-corrosive, friction-reducing and antiwear properties.

5-Fluorouracil loaded thermosensitive PLGA–PEG–PLGA hydrogels for the prevention of postoperative tendon adhesion

Baoming Yuan, Chaoliang He, Xiaoming Dong, Jincheng Wang, Zhongli Gao, Qian Wang, Huayu Tian and Xuesi Chen

RSC Adv., 2015,**5**, 25295-25303
DOI: 10.1039/C5RA01307K

Thermosensitive PLGA–PEG–PLGA hydrogels containing 5-fluorouracil were applied to cover the sutured Achilles tendon of rats, leading to a significant reduction in adhesion formation during the tendon healing.

Hierarchical three-dimensional $NiCo_2O_4$ nanoneedle arrays supported on Ni foam for high-performance supercapacitors

Jian Wu, Rui Mi, Shaomin Li, Pan Guo, Jun Mei, Hao Liu, Woon-Ming Lau and Li-Min Liu

RSC Adv., 2015,**5**, 25304-25311
DOI: 10.1039/C4RA16937A

A novel $NiCo_2O_4$ nanoneedle arrays with bottom crosslinked nanosheets grew on Ni foam as advanced binder-free electrodes *via* a facile one-step hydrothermal method followed by annealing in air, which exhibited high electrochemical performance.

Design, synthesis and anticancer activity of furochromone and benzofuran derivatives targeting VEGFR-2 tyrosine kinase

Omaima M. Abdelhafez, Hamed I. Ali, Kamelia M. Amin, Mohamed M. Abdalla and Eman Y. Ahmed

RSC Adv., 2015,**5**, 25312-25324
DOI: 10.1039/C4RA16228E

Furochromone and benzofuran derivatives were synthesized, docked and evaluated for their anti-VEGFR-2 activity, cytotoxicity, and *in vivo* antiprostate cancer activity.

Electricity generation by biocathode coupled photoelectrochemical cells

Yue Du, Youpeng Qu, Xiangtong Zhou and Yujie Feng

RSC Adv., 2015,**5**, 25325-25328
DOI: 10.1039/C4RA15965A

Biocathode coupled photoelectrochemical cells (Bio-PEC) have the potential for electricity generation and pollutant removal, with the simultaneous utilization of both solar energy and bioenergy.

Mussel inspired preparation of highly dispersible and biocompatible carbon nanotubes

Qing Wan, Jianwen Tian, Meiying Liu, Guangjian Zeng, Zhen Li, Ke Wang, Qingsong Zhang, Fengjie Deng, Xiaoyong Zhang and Yen Wei

RSC Adv., 2015,**5**, 25329-25336
DOI: 10.1039/C4RA13408G

A novel method for preparation of water dispersible and biocompatible carbon nanotubes *via* mussel inspired PEGylation has been developed for the first time.

Removal of Rhodamine B from wastewater by modified *Volvariella volvacea*: batch and column study

Qiao Li, Xia Tang, Yuanyuan Sun, Yifan Wang, Yunchuan Long, Juan Jiang and Heng Xu

RSC Adv., 2015,**5**, 25337-25347
DOI: 10.1039/C4RA17319H

This study investigated the biosorption of Rhodamine B (a carcinogenic dye) onto *Volvariella volvacea* in batch and bed column experiments.

Effect of the functional diamine structure on the properties of a polyimide liquid crystal alignment film

Ming Liu, Xinguo Zheng, Shiming Gong, Lulu Liu, Zhen Sun, Leishan Shao and Yinghan Wang

RSC Adv., 2015,**5**, 25348-25356
DOI: 10.1039/C4RA16997B

A novel functional diamine containing triphenylamine moiety and biphenyl as well as a long alkyl chain, 4-dodecyloxy-biphenyl-4,4-diaminotriphenylamine (DBDTA), was synthesized and characterized.

Physical and electrochemical characterization of reduced graphene oxide/silver nanocomposites synthesized by adopting a green approach

Indranil Roy, Dipak Rana, Gunjan Sarkar, Amartya Bhattacharyya, Nayan Ranjan Saha, Soumya Mondal, Sutanuka Pattanayak, Sanatan Chattopadhyay and Dipankar Chattopadhyay

RSC Adv., 2015,**5**, 25357-25364
DOI: 10.1039/C4RA16197A

Synthesis and characterization of reduced graphene oxide/silver (RGO/Ag) nanocomposites by adopting green approach.

Beckmann rearrangement reaction of cyclohexanone oxime in sub/supercritical water: byproduct and selectivity

Yang Li, Kai Wang, Kang Qin and Tao Wang

RSC Adv., 2015,**5**, 25365-25371
DOI: 10.1039/C5RA01929J

The byproduct acetamide was proposed for the Beckmann rearrangement reaction of cyclohexanone oxime in subcritical and supercritical water.

Anaerobic ammonium oxidation (ANAMMOX) sludge immobilized by waterborne polyurethane and its nitrogen removal performance-a lab scale study

Guanghui Chen, Jun Li, Salma Tabassum and Zhenjia Zhang

RSC Adv., 2015,**5**, 25372-25381
DOI: 10.1039/C4RA14451A

ANAMMOX granules immobilized by WPU exhibited the best entrapment support, superb bioactivity, high nitrogen removal rate and highest mechanical stability.

Synthesis and biological evaluation of a fatty acyl di-cytarabine prodrug

Feifei Li, Jing Liu, Jiaxing Shi and Yuxia Luan

RSC Adv., 2015,**5**, 25382-25388
DOI: 10.1039/C4RA17255H

A fatty acyl di-cytarabine prodrug is synthesized for overcoming the disadvantage of cytarabine in biomedical applications.

Adsorption of hexavalent chromium by polyacrylonitrile (PAN)-based activated carbon fibers from aqueous solution

Zhengjiang Jiang, Yunguo Liu, Guangming Zeng, Weihua Xu, Bohong Zheng, Xiaofei Tan and Shufan Wang

RSC Adv., 2015,**5**, 25389-25397
DOI: 10.1039/C5RA01844G

Polyacrylonitrile (PAN)-based activated carbon fibers (PAC400 and PAC600) were prepared by heating $Zn(NO_3)_2$ pretreated-PAN at 400 °C and 600 °C for the removal of Cr(VI) from aqueous solution.

Formation and investigation of unstable complex hydrides from tetrabutylammonium fluoride, water and SO_2

Erhong Duan, Kun Yang, Yu Song, Peng Zhang, Wei Meng and Lei Yu

RSC Adv., 2015,**5**, 25398-25402
DOI: 10.1039/C4RA15781H

A phase separation occurred when SO_2 was introduced into the binary system of tetrabutylammonium fluoride (TBAF) and water system.

Microscopic origin of MXenes derived from layered MAX phases

Zhonglu Guo, Linggang Zhu, Jian Zhou and Zhimei Sun

RSC Adv., 2015,**5**, 25403-25408
DOI: 10.1039/C4RA17304J

Two-dimensional transition metal carbides/nitrides $M_{n+1}X_n$s labeled as MXenes derived from MAX phases attract increasing interest due to their promising applications as Li-ion battery anodes, hybrid electro-chemical capacitors and electronic devices.

A real-time colorimetric and ratiometric fluorescent probe for rapid detection of SO_2 derivatives in living cells based on a near-infrared benzopyrylium dye

Wenqiang Chen, Xingjiang Liu, Song Chen, Xiangzhi Song and Jian Kang

RSC Adv., 2015,**5**, 25409-25415
DOI: 10.1039/C4RA15067H

Near-infrared benzopyrylium dye was employed as a fast-responding ratiometric fluorescent probe for sensitive and selective detection of SO_2 derivatives in 100% aqueous solution as well as in living cells.

Graphene oxide reinforced poly(vinyl alcohol): nanocomposite scaffolds for tissue engineering applications

Cijun Shuai, Pei Feng, Chengde Gao, Xiong Shuai, Tao Xiao and Shuping Peng

RSC Adv., 2015,**5**, 25416-25423
DOI: 10.1039/C4RA16702C

In this study, graphene oxide is incorporated into poly(vinyl alcohol) for the purpose of improving the mechanical properties. Nanocomposite scaffolds with an interconnected porous structure are fabricated by selective laser sintering.

Investigation of the activity and stability of Pd-based catalysts towards the oxygen reduction (ORR) and evolution reactions (OER) in iron–air batteries

C. Alegre, A. Stassi, E. Modica, C. Lo Vecchio, A. S. Aricò and V. Baglio

RSC Adv., 2015,**5**, 25424-25427
DOI: 10.1039/C4RA15578E

Palladium on carbon has proved to be a suitable bi-functional catalyst for application in the air electrode of a metal–air battery.

Non-invasive imaging of breast cancer using RGDyK functionalized fluorescent carbonaceous nanospheres

Shaobo Ruan, Jun Qian, Shun Shen, Jiantao Chen, Xingli Cun, Jianhua Zhu, Xinguo Jiang, Qin He and Huile Gao

RSC Adv., 2015,**5**, 25428-25436
DOI: 10.1039/C5RA00099H

RGD functionalized carbonaceous dots were prepared and utilized for non-invasive breast cancer imaging.

Novel magnetic antimicrobial nanocomposites for bone tissue engineering applications

Arundhati Bhowmick, Arijit Saha, Nilkamal Pramanik, Subhash Banerjee, Manas Das and Patit Paban Kundu

RSC Adv., 2015,**5**, 25437-25445
DOI: 10.1039/C5RA02413G

Here we have developed novel bone-like superparamagnetic nanocomposites for bone tissue engineering. These nanocomposites exhibited high water uptake ability, excellent mechanical properties, good antimicrobial activities and blood compatibility.

Facile construction of graphene-like Ni_3S_2 nanosheets through the hydrothermally assisted sulfurization of nickel foam and their application as self-supported electrodes for supercapacitors

Ming Zhuo, Ping Zhang, Yuejiao Chen and Qiuhong Li

RSC Adv., 2015,**5**, 25446-25449
DOI: 10.1039/C3RA45152F

A facile and low-cost approach has been developed for the fabrication of large-area nickel sulfide nanosheets *via* the hydrothermally assisted sulfurization of Ni foam.

Facile fabrication of silica–polymer–graphene collaborative nanostructure-based hybrid materials with high conductivity and robust mechanical performance

Wenqiong Ye, Ling Zhang and Chunzhong Li

RSC Adv., 2015,**5**, 25450-25456
DOI: 10.1039/C5RA02126J

SiO_2@poly(methyl methacrylate)–reduced graphene oxide composites with outstanding thermal stability, robust mechanical performance and excellent conductivity have been prepared by dispersion polymerization and electrostatic assembly.

Synthesis of diacylglycerol analogs bearing photoaffinity tags for labelling mammalian diacylglycerol kinase

Sammy Eni Eni, Meng Rowland and Michael D. Best

RSC Adv., 2015,**5**, 25457-25461
DOI: 10.1039/C4RA16730A

This communication reports the synthesis of diacylglycerol (DAG) probes with different photoaffinity tags for cross-linking and reducing the activity diacylglycerol kinase (DGK).

Fabrication of hydroxyapatite/chitosan porous materials for Pb(II) removal from aqueous solution

Yong Lei, Jun-Jie Guan, Wei Chen, Qin-Fei Ke, Chang-Qing Zhang and Ya-Ping Guo

RSC Adv., 2015,**5**, 25462-25470
DOI: 10.1039/C5RA01628B

Hydroxyapatite/chitosan porous materials are fabricated by a freeze-drying method for Pb(II) removal from aqueous solution.

Controlled removal of monolayers for bilayer graphene preparation and visualization

Lin Gan, Haijing Zhang, Ruizhe Wu, Yao Ding, Ping Sheng and Zhengtang Luo

RSC Adv., 2015,**5**, 25471-25476
DOI: 10.1039/C5RA00865D

Selective oxidation of monolayer graphene allows the visualization and preparation of bilayer graphene.

Multifold ring closing metathesis reactions in the formation of resorcin[4]arene cavitands

Sumedh Parulekar, Kirankirti Muppalla, Ali Husain and Kirpal S. Bisht

RSC Adv., 2015,**5**, 25477-25484
DOI: 10.1039/C5RA00760G

The formation of the resorcin[4]arene cavitands by the ring closing metathesis (RCM) reaction depends, to a large extent, on the conformation and the substituents on the upper and lower rim of the perallylated resorcin[4]arenes.

Diaryliodonium salts as efficient Lewis acid catalysts for direct three component Mannich reactions

Yanxia Zhang, Jianwei Han and Zhen-Jiang Liu

RSC Adv., 2015,**5**, 25485-25488
DOI: 10.1039/C5RA00209E

Diaryliodonium(III) salts, as highly active and versatile Lewis acid catalysts for the direct three component Mannich reaction under solvent free conditions, have been investigated.

The P-site A76 2-OH acts as a peptidyl shuttle in a stepwise peptidyl transfer mechanism

Hadieh Monajemi, Sharifuddin Mohd Zain and Wan Ahmad Tajuddin Wan Abdullah

RSC Adv., 2015,**5**, 25489-25503
DOI: 10.1039/C5RA02767E

The P-site-A76-2OH transfers the polypeptide chain to the A-site -amine and A2451 facilitates this transfer by acting as proton shuttle.

Scalable, template-free synthesis of conducting polymer microtubes

Kryssia P. Díaz-Orellana and Mark E. Roberts

RSC Adv., 2015,**5**, 25504-25512
DOI: 10.1039/C4RA16000B
From themed collection Polymers for Electrochemical Energy Storage

A template-free synthesis method is used to create polypyrrole microtubes on stainless steel mesh substrates. The physical and electrochemical properties of the microtubes can be tailored by changing substrate dimensions and growth conditions.

Exceptional proton affinities of push–pull nitriles substituted by the guanidino and phosphazeno groups

Ewa D. Raczyska, Jean-François Gal and Pierre-Charles Maria

RSC Adv., 2015,**5**, 25513-25517
DOI: 10.1039/C5RA02716K

The G2(MP2)-calculated PA(*N*-cyano) for $(H_2N)_2C{=}N{-}C{\equiv}N$ and $(H_2N)_3P{=}N{-}C{\equiv}N$ are larger than that of $HC{\equiv}N$ by 186 and 250 kJ mol^{1}, respectively.

Curcumin entrapped folic acid conjugated PLGA–PEG nanoparticles exhibit enhanced anticancer activity by site specific delivery

Jisha J. Pillai, Arun Kumar T. Thulasidasan, Ruby John Anto, Nandan C. Devika, N. Ashwanikumar and G. S. Vinod Kumar

RSC Adv., 2015,**5**, 25518-25524
DOI: 10.1039/C5RA00018A

Herein we report curcumin entrapped nanoparticles of PLGA–PEG copolymer which were conjugated with folic acid (PPF copolymer) for site specific targeting since many cancer cells exhibit external folic acid binding receptors.

Effect of water state and polymer chain motion on the mechanical properties of a bacterial cellulose and polyvinyl alcohol (BC/PVA) hydrogel

Lifeng Li, Li Ren, Lin Wang, Sa Liu, Yongrou Zhang, Liqun Tang and Yingjun Wang

RSC Adv., 2015,**5**, 25525-25531
DOI: 10.1039/C4RA11594E

The effects of water state and polymer chain motion on the mechanical property of bacterial cellulose and a polyvinyl alcohol hydrogel.

Correction: Biogenic synthesis of ZnO–Ag nano custard apples for efficient photocatalytic degradation of methylene blue by sunlight irradiation

S. Kaviya and Edamana Prasad

RSC Adv., 2015,**5**, 25532-25532
DOI: 10.1039/C5RA90023A

The sonochemical synthesis of Ga@C-dots particles

Vijay Bhooshan Kumar, Ilana Perelshtein, Anat Lipovsky, Ze'ev Porat and Aharon Gedanken

RSC Adv., 2015,**5**, 25533-25540
DOI: 10.1039/C5RA01101A

This research article is focused on a one-step sonochemical fabrication of carbon dots doped with Ga atom.

Adsorption of sulfamethazine by multi-walled carbon nanotubes: effects of aqueous solution chemistry

Quanquan Yang, Guangcai Chen, Jianfeng Zhang and Helian Li

RSC Adv., 2015,**5**, 25541-25549
DOI: 10.1039/C4RA15056B

The adsorption of SMZ by MWCNTs was studied under varied pH, ionic strength, cations and anions in solution. The results indicated that hydrophobic and electrostatic interactions were the main adsorption mechanisms, and – interaction also played an important role.

Fabrication and physical properties of self-assembled ultralong polymer/small molecule hybrid microstructures

Jing Zhang, Chengyuan Wang, Wangqiao Chen, Jiansheng Wu and Qichun Zhang

RSC Adv., 2015,**5**, 25550-25554
DOI: 10.1039/C5RA01167A

The present work showed a novel approach to fabricate polymer/small molecule hybrid microstructures, and the transport characteristics and morphologies of the as-fabricated wires with different ratios of the two different components.

Transparent nanophosphor films with high quantum efficiency through cold compaction

R. Kubrin, J. J. do Rosário and G. A. Schneider

RSC Adv., 2015,**5**, 25555-25564
DOI: 10.1039/C5RA01248A

Compaction of nanophosphor coatings by means of cold isostatic pressing is shown to dramatically improve their optical and mechanical properties.

Synthesis, dispersion and lubrication potential of basal plane functionalized alkylated graphene nanosheets

Harshal P. Mungse, Niranjan Kumar and Om P. Khatri

RSC Adv., 2015,**5**, 25565-25571
DOI: 10.1039/C4RA16975A

Basal plane functionalized alkylated graphene nanosheets, dispersed in lube oil, exhibit remarkably improved friction and wear properties of steel tribo-pairs.

Determination of benzoylurea insecticides in environmental water and honey samples using ionic-liquid-mingled air-assisted liquid–liquid microextraction based on solidification of floating organic droplets

Miyi Yang, Xuefei Xi, Xiaoling Yang, Lizhen Bai, Runhua Lu, Wenfeng Zhou, Sanbing Zhang and Haixiang Gao

RSC Adv., 2015,**5**, 25572-25580
DOI: 10.1039/C5RA00140D

This method combined the advantages of air-assisted liquid–liquid microextraction and solidified floating organic droplet microextraction with a mixture extractant.

A study of the solvent effect on the crystal morphology of hexogen by means of molecular dynamics simulations

Gang Chen, Chunyu Chen, Mingzhu Xia, Wu Lei, Fengyun Wang and Xuedong Gong

RSC Adv., 2015,**5**, 25581-25589
DOI: 10.1039/C4RA07544G

In this work, molecular dynamics simulations have been performed to study the solvent effect on the crystal morphology of hexogen.

Influence of ionic liquids as solvents for the chemical synthesis of poly(3-octylthiophene) with $FeCl_3$

Tae-Joon Park, Yong Seok Kim, Eunsung Kan and Sang Hyun Lee

RSC Adv., 2015,**5**, 25590-25593
DOI: 10.1039/C5RA01003A

Ionic liquids were used as solvents for the oxidative polymerization of 3-octylthiophene. An excellent yield of 99% was obtained by using [BmIm][SbF_6]. The effect of the IL structure on the oxidative polymerization was statistically analyzed.

Photophysics of tungsten–benzylidyne complexes derived from *s*-indacene: synthesis, characterization and DFT studies

Cesar A. Morales-Verdejo, Ximena Zarate, Eduardo Schott, Sebastián Correa and Iván Martinez-Díaz

RSC Adv., 2015,**5**, 25594-25602
DOI: 10.1039/C4RA16874G

The photophysics of the mono- and homobimetallic complexes of tungsten benzylidyne has been examined by using absorption and emission. Theoretical calculations were carried out to gain further understanding of these novel molecular systems.

Electrochemical behavior of Zn–graphene composite coatings

M. K. Punith Kumar, Mahander Pratap Singh and Chandan Srivastava

RSC Adv., 2015,**5**, 25603-25608
DOI: 10.1039/C5RA02898A

Synthesis and electrochemical properties of highly corrosion resistant Zn–graphene composite coating.

Wearable temperature sensor based on graphene nanowalls

Jun Yang, Dapeng Wei, Linlong Tang, Xuefen Song, Wei Luo, Jin Chu, Tianpeng Gao, Haofei Shi and Chunlei Du

RSC Adv., 2015,**5**, 25609-25615
DOI: 10.1039/C5RA00871A

This work reports an ultrasensitive wearable temperature sensor based on GNWs/PDMS for personalized healthcare and human–machine interface systems.

Antireflective gradient-refractive-index material-distributed microstructures with high haze and superhydrophilicity for silicon-based optoelectronic applications

Minkyu Choi, Jung Woo Leem and Jae Su Yu

RSC Adv., 2015,**5**, 25616-25624
DOI: 10.1039/C4RA15686B

Antireflective gradient-refractive-index material-distributed microstructures consisting of hierarchical MgF_2/SU8 MCs/Si with high haze and superhydrophilicity.