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Nationwide Survey of the Undergraduate Physical Chemistry Course
Laura J. Fox* and Gillian H. Roehrig

1466 **S** DOI: 10.1021/acs.jchemed.5b00324
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Marilyne Stains,* Matthew Pilarz, and Devasmita Chakraverty

1477 DOI: 10.1021/acs.jchemed.5b00218
Defining Conceptual Understanding in General Chemistry
Thomas A. Holme,* Cynthia J. Luxford, and Alexandra Brandriet

1484 DOI: 10.1021/ed500891w
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Seoung-Hey Paik*

1490 **S** DOI: 10.1021/acs.jchemed.5b00225
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1503 **S** DOI: 10.1021/ed500830w
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Thomas S. Kuntzleman*

1507 **S** DOI: 10.1021/acs.jchemed.5b00277
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Christina G. Collison,* Jeremy Cody, Darren Smith, and Jennifer Swartzenberg

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Christopher A. Knudtson*

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Fun Man Fung*

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1531 **S**

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Kinetics of Carbaryl Hydrolysis: An Undergraduate Environmental Chemistry Laboratory
Darryl Hawker*

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Solution-Phase Synthesis of Dipeptides: A Capstone Project That Employs Key Techniques in an Organic Laboratory Course
Louis Marchetti and Brenton DeBoef*

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Synthesis of 10-Ethyl Flavin: A Multistep Synthesis Organic Chemistry Laboratory Experiment for Upper-Division Undergraduate Students
Vincent A. Sichula*

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Synthesis of a Biologically Active Oxazol-5-(4H)-one via an Erlenmeyer-Plöchl Reaction
Catarina A. B. Rodrigues, José M. G. Martinho, and Carlos A. M. Afonso*

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DOI: 10.1021/acs.jchemed.5b00159

M²⁺•EDTA Binding Affinities: A Modern Experiment in Thermodynamics for the Physical Chemistry Laboratory

Leah C. O'Brien,* Hannah B. Root, Chin-Chuan Wei, Drake Jensen, Nahid Shabestary, Cristina De Meo, and Douglas J. Eder

1552 **S**

DOI: 10.1021/ed5002569

Isothermal Titration Calorimetry and Macromolecular Visualization for the Interaction of Lysozyme and Its Inhibitors

Chin-Chuan Wei,* Drake Jensen, Tiffany Boyle, Leah C. O'Brien, Cristina De Meo, Nahid Shabestary, and Douglas J. Eder

Technology Reports

1557 **S**

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Visualizing Three-Dimensional Hybrid Atomic Orbitals Using Winplot: An Application for Student Self Instruction

Andrian Saputra,* Lorentz R. Canaval, Sunyono, Noor Fadiawati, Chansyanah Diawati, M. Setyorini, Nina Kadaritna, and Budi Kadaryanto

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DOI: 10.1021/ed500667c

Using Presentation Software To Flip an Undergraduate Analytical Chemistry Course

Neil Fitzgerald* and Luisa Li

Communications

1564 **S**

DOI: 10.1021/acs.jchemed.5b00024

Introduction to the Spring 2014 ConfChem on the Flipped Classroom

Chris Luker,* Jennifer Muzyka, and Robert Belford

1566 **S**

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ConfChem Conference on Flipped Classroom: Student Engagement with Flipped Chemistry Lectures

Michael K. Seery*

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DOI: 10.1021/ed5009156

ConfChem Conference on Flipped Classroom: Time-Saving Resources Aligned with Cognitive Science To Help Instructors

JudithAnn R. Hartman, Donald J. Dahm, and Eric A. Nelson*

1570 **S**

DOI: 10.1021/ed500914w

ConfChem Conference on Flipped Classroom: Reclaiming Face Time—How an Organic Chemistry Flipped Classroom Provided Access to Increased Guided Engagement

Bridget G. Trogden*

1572 **S**

DOI: 10.1021/ed500917j

ConfChem Conference on Flipped Classroom: Using a Blog To Flip a Classroom
January D. Haile*

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DOI: 10.1021/ed500875n

ConfChem Conference on Flipped Classroom: Flipping at an Open-Enrollment College
Kelly B. Butzler*

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DOI: 10.1021/ed500899e

ConfChem Conference on Flipped Classroom: Improving Student Engagement in Organic Chemistry Using the Inverted Classroom Model
Robert D. Rossi*

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DOI: 10.1021/ed500904y

ConfChem Conference on Flipped Classroom: Just-in-Time Teaching in Chemistry Courses with Moodle
Jennifer L. Muzyka*

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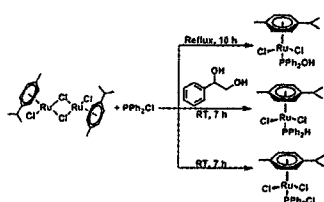
DOI: 10.1021/ed500968v

ConfChem Conference on Flipped Classroom: Spring 2014 ConfChem Virtual Poster Session
Robert E. Belford,* Matthew Stoltzfus, and Justin B. Houseknecht

S Supporting Information available via online article

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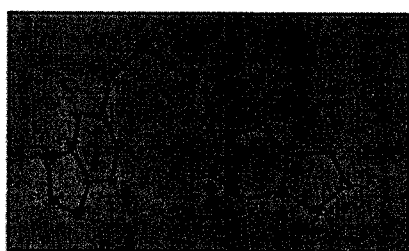
Regular Articles



Synthesis and unexpected reactivity of $[\text{Ru}(\eta^6\text{-cymene})\text{Cl}_2(\text{PPh}_2\text{Cl})]$, leading to $[\text{Ru}(\eta^6\text{-cymene})\text{Cl}_2(\text{PPh}_2\text{H})]$ and $[\text{Ru}(\eta^6\text{-cymene})\text{Cl}_2(\text{PPh}_2\text{OH})]$ complexes

Arun Kumar Pandiakumar and Ashoka G Samuelson 1329–1338

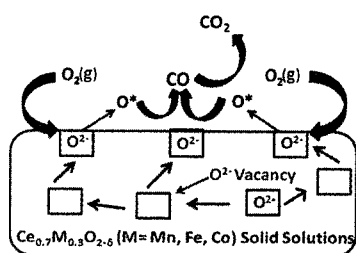
Synthesis and unusual reactivity of some ruthenium half-sandwich complexes including an unusual organocatalysed conversion of PPh_2Cl to PPh_2H are reported.



Synthesis and characterization of novel benzo[*d*][1,3]dioxole substituted organo selenium compounds: X-ray structure of 1-((benzo[*d*][1,3]dioxol-5-yl)methyl)-2-((benzo[*d*][1,3]dioxol-6-yl)methyl)diselane

Yogesh Nagpal, Rajeev Kumar and K K Bhasin 1339–1346

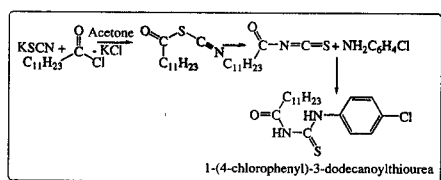
A direct and concise method is reported to furnish novel benzo[*d*][1,3]dioxole incorporated diselenide using stable and readily available starting material. 1-((benzo[*d*][1,3]dioxol-5-yl)methyl)-2-((benzo[*d*][1,3]dioxol-6-yl)methyl)diselane, thus synthesized was transformed into various synthetically important unsymmetrical monoselenides by cleavage of Se–Se bond with sodium borohydride or rongalite.



Investigation of physicochemical properties and catalytic activity of nanostructured $\text{Ce}_{0.7}\text{M}_{0.3}\text{O}_{2-\delta}$ ($\text{M} = \text{Mn}, \text{Fe}, \text{Co}$) solid solutions for CO oxidation

P Venkataswamy, D Jampaiah, C U Aniz and Benjaram M Reddy 1347–1360

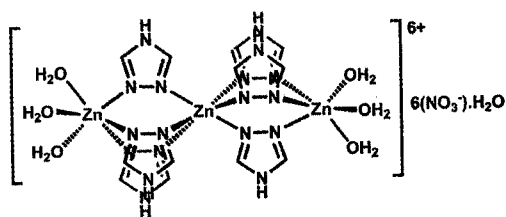
The presence of structural oxygen vacancies, low temperature reducibility and synergetic interaction between Ce–O and Mn–O oxides were responsible for superior CO oxidation performance of Ce–Mn–O nano oxide compared to pure CeO_2 , Ce–Fe–O and Ce–Co–O samples.



Aggregation and electrochemical properties of 1-(4-chlorophenyl)-3-dodecanoylthiourea: A novel thiourea-based non-ionic surfactant

Imdad Ullah, Afzal Shah, Musharaf Khan, Khalida Akhter and Amin Badshah 1361–1367

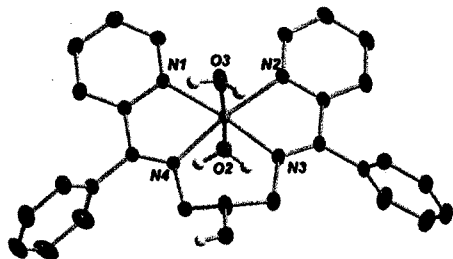
A novel thiourea-based non-ionic surfactant 1-(4-chlorophenyl)-3-dodecanoylthiourea (4CPDT) was synthesized from decanoyl chloride, potassium thiocyanate and 4-chloroaniline in high yield. The structural chemistry of the compound was done by multiple nuclear NMR (^1H , ^{13}C) and FT-IR. UV-Visible spectrophotometry and pendant drop methods were used to evaluate the CMC in ethanol and hexane.



Crystal structure and solid-state properties of discrete hexa cationic trinuclear Zinc Triazole cluster

Chatla Naga Babu, Paladugu Suresh, Arruri Sathyanarayana, Prasenjit Das and Ganesan Prabusankar 1369–1373

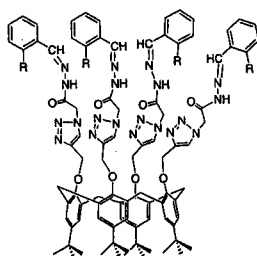
A rare linear, discrete, hexa-cationic trinuclear zinc triazole cluster has been synthesized and structurally characterized.



DNA binding and cleavage activity of a structurally characterized Ni(II) Schiff base complex

Sarat Chandra Kumar, Abhijit Pal, Merry Mitra, V M Manikandamathavan, Chia -Her Lin, Balachandran Unni Nair and Rajarshi Ghosh . . 1375–1381

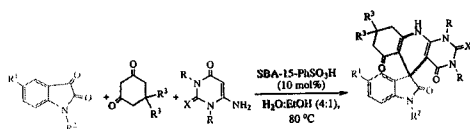
Synthesis and characterization of a mononuclear Ni(II) complex $[\text{Ni}(\text{L})_2(\text{H}_2\text{O})_2](\text{NO}_3)_2$ [$\text{L} = \text{N},\text{N}'\text{-bis}((\text{pyridine-2-yl})\text{phenylidene})\text{-1,3-diaminopropan-2-ol}$] (1) is reported. 1 crystallizes in P-1 space group. Spectroscopic and hydrodynamic investigations on the binding property of the complex with DNA have revealed groove or electrostatic nature of binding of 1 with DNA. 1 is also found to induce oxidative cleavage of the supercoiled pUC 18 DNA to its nicked circular form in a concentration dependent manner.



Thiacalix[4]arene derivatives containing multiple aromatic groups: Highly efficient extractants for organic dyes

Chuang Yang, Zusheng Wang, Hongyu Guo, Ziyu Jiao and Fafu Yang 1383–1388

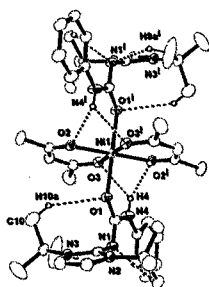
Two novel thiacalix[4]arene derivatives containing multiple aromatic groups were synthesized in yields of 86% and 90%. These complexation experiments showed that thiacalix[4]arene receptors possess excellent complexation capabilities for four tested dyes.



Sulfanilic acid functionalized mesoporous SBA-15: A water-tolerant solid acid catalyst for the synthesis of uracil fused spirooxindoles as antioxidant agents

Robabeh Baharfar and Razieh Azimi 1389–1395

Green synthesis of uracil-fused spirooxindoles using sulfanilic acid-functionalized SBA-15 as a reusable heterogeneous acid catalyst and the antioxidant activity of the synthesized compounds are described.

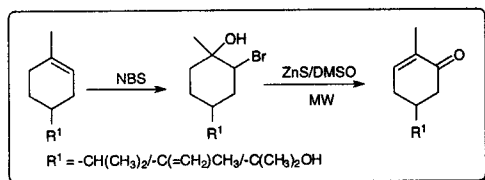


Nickel(II) complexes having Imidazol-2-ylidene-N'-phenylurea ligand in the coordination sphere – syntheses and solid state structures

Kishor Naktode, Abhinanda Kundu, Sudeshna Saha, Hari Pada Nayek and Tarun K Panda 1397–1404

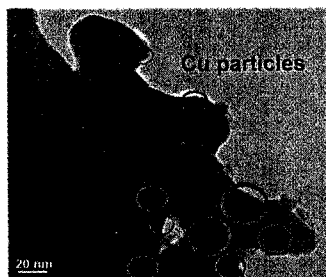
We report the synthesis and structures of two octahedral nickel(II) complexes supported by imidazol-2-ylidene-N'-phenylureate ligand.

Microwave assisted bi-functional activation of β -bromo-*tert*-alcohols



Kannan Nandini, Manjunatha Javagal Rangaswamy and Bettadaiah Bheemanakere Kemapaiah 1405–1410

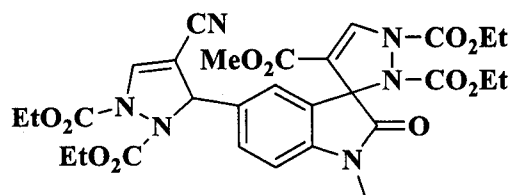
Microwave-assisted bi-functional activation of β -bromo-*tert*-alcohols to afford 2,3-unsaturated ketones is reported. The dehydration-oxidation of β -bromo-*tert*-alcohols occurs with DMSO in the presence of ZnS under solvent-free condition.



Significant improvement of electrochemical performance of Cu-coated LiVPO_4F cathode material for lithium-ion batteries

Yu Zhang, Xiaolan Bai and Cuiling Li 1411–1416

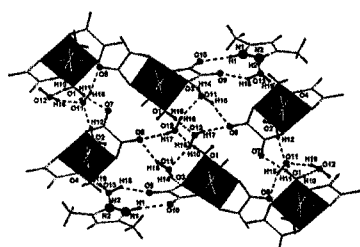
Nano-Cu coating on the surface of pristine LiVPO_4F particles is successfully synthesized for the first time via a soft chemical route with mechanical activation assistance. The effect of Cu coating on the crystalline structure, morphology and electrochemical performance of the pristine sample has been investigated in detail.



An efficient and facile synthesis of divergent C-3/C-5 bis-functionalized 2-oxindoles from 5-formyl-Morita-Baylis-Hillman adducts of oxindole

Kodirajan Selvakumar, Kandapalam Arun Prasath Lingam, Rama Varma Luxmi Varma and Poovan Shanmugavelan . . 1417–1426

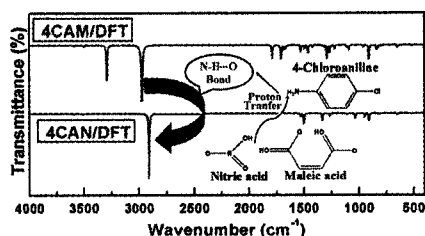
An efficient and facile synthesis of divergent C-3/C-5 bis-functionalized 2-oxindoles has been achieved from 3,5-bis-Morita-Baylis-Hillman (MBH) adducts. A wider substrate scope/rate acceleration has been noted under a typical reaction condition and also the synthetic usefulness of bis-allyl derivatives has been demonstrated by the synthesis of potent bis-pyrazole *via* [3+2]-annulation strategy.



Synthesis, Crystal structure and Characterization of a New Oxalate Chromium(III) Complex

Rihab Dridi, Saoussen Cherni and Mohamed Faouzi Zid . . . 1427–1433

Fragments of the molecular structure of the complex show clearly the intermolecular $\text{N-H}\cdots\text{O}$ and $\text{O-H}\cdots\text{O}$ hydrogen bonds between the cation, the complex anion and the lattice water molecules which contribute to the cohesion of the ionic structure, leading to a three dimensional network.



Structural and vibrational spectral studies on hydrogen bonded salts: 4-chloroanilinium maleate and nitrate

R Anitha, M Gunasekaran, S Suresh Kumar and S Athimoolam . . 1435–1450

The proton transfer from the nitric and maleic acids to amine group (of 4-chloroaniline) lead to hydrogen bonded crystals of 4-chloroanilinium maleate (4CAM) and 4-chloroanilinium nitrate (4CAN). The molecular structures of these two compounds were optimized with the Density Functional Theory (DFT) and Hartree-Fock (HF) methods. Geometrical parameters of the molecules were analyzed along with their intermolecular hydrogen bond which tailors the ions. These analyses show that the molecular aggregations are stabilized through the $\text{N-H}\cdots\text{O}$ and $\text{O-H}\cdots\text{O}$ hydrogen bonds. The vibrational modes were computed by quantum chemical methods and further investigated by FT-IR and FT-Raman spectroscopy in the range of $4000\text{--}400\text{ cm}^{-1}$.