

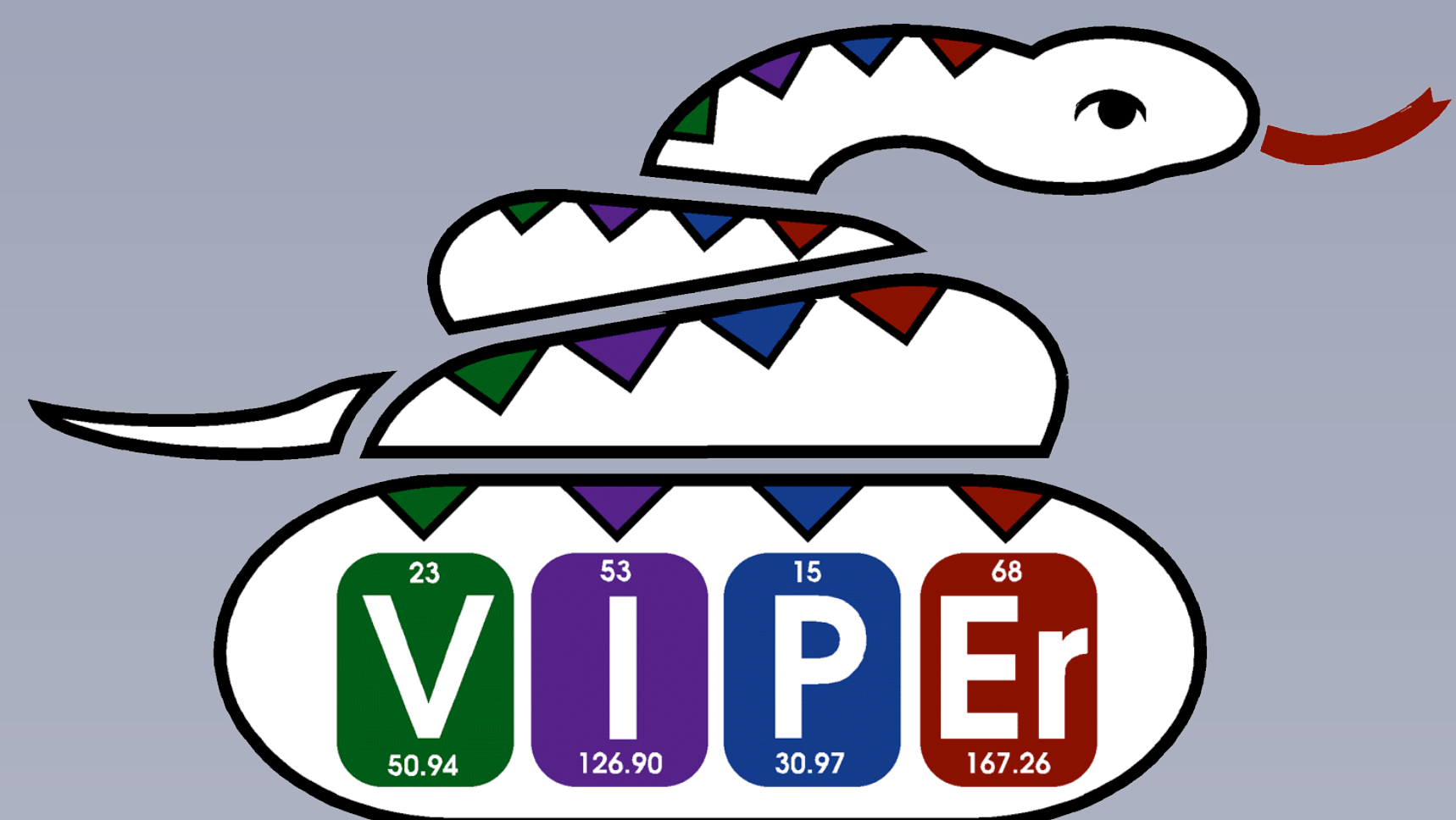
The Virtual Inorganic Pedagogical Electronic Resource

<http://www.ionicviper.org>

A community for teachers and students of inorganic chemistry

A dynamic library of curricular materials

Social networking tools for interactive discussion



Leadership Council (clockwise from top left)

Joanne L. Stewart, Hope College

Lori A. Watson, Earlham College

Ethan Benatan, Reed College (technology guru)

Adam R. Johnson, Harvey Mudd College

Elizabeth R. Jamieson, Smith College

Jezmynne Dene, Claremont U Consortium (librarian)

B. Scott Williams, JSD, Claremont Colleges

Margret J. Geselbracht, Reed College

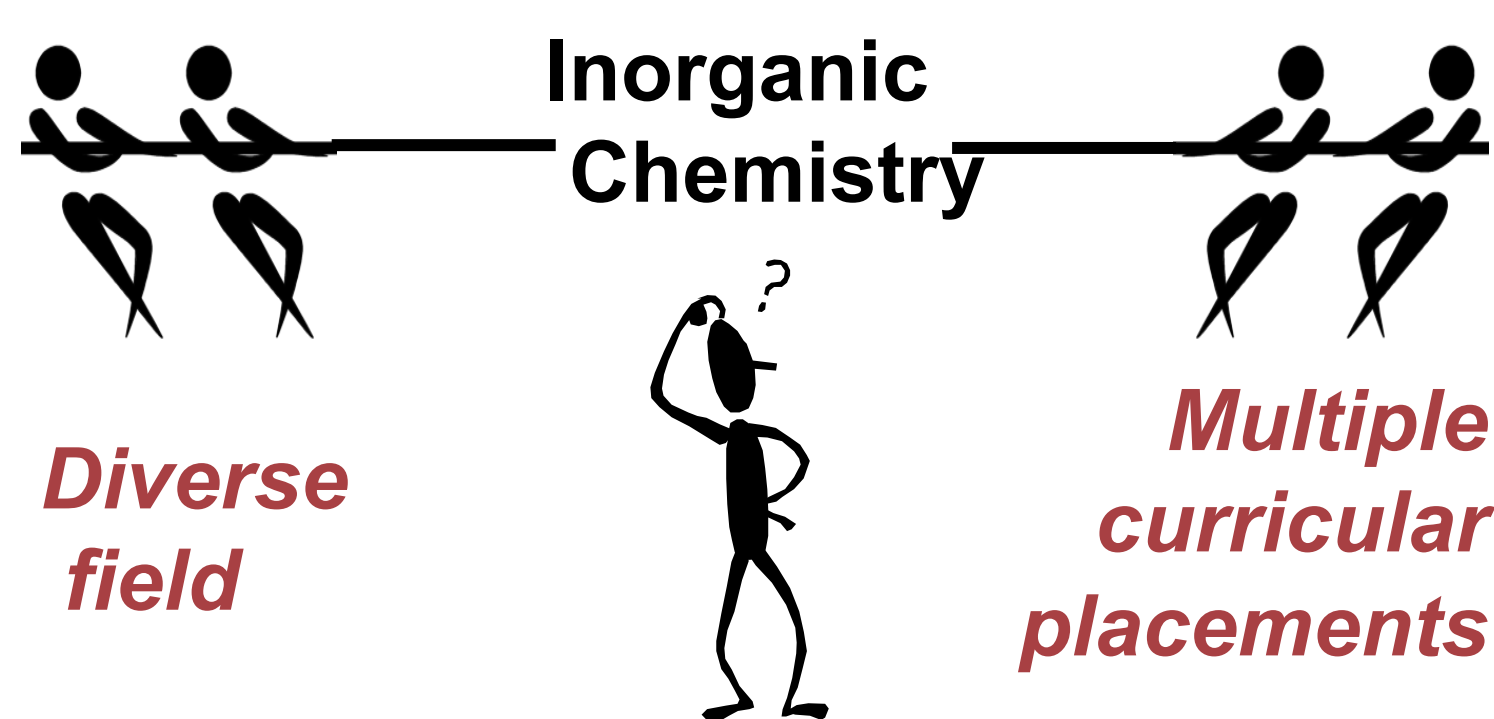
Barbara A. Reisner, James Madison University

Hilary J. Eppley, DePauw University



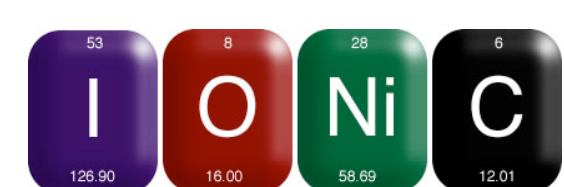
Come for the content, stay for the community!

Challenges for Inorganic Chemists at PUIs



- Isolation:** Professional and geographical
Typically only one inorganic chemist per PUI
- Narrow/deep specialization:**
How to represent whole field to students?
Outside "comfort zone"
Hinders curricular innovation

Solution: Build a Community of Practice for the Teaching of Inorganic Chemistry:



Interactive Online Network of Inorganic Chemists

Sharing of Materials

Face-to-Face



Virtual

Networking with Colleagues

Ongoing Professional Development

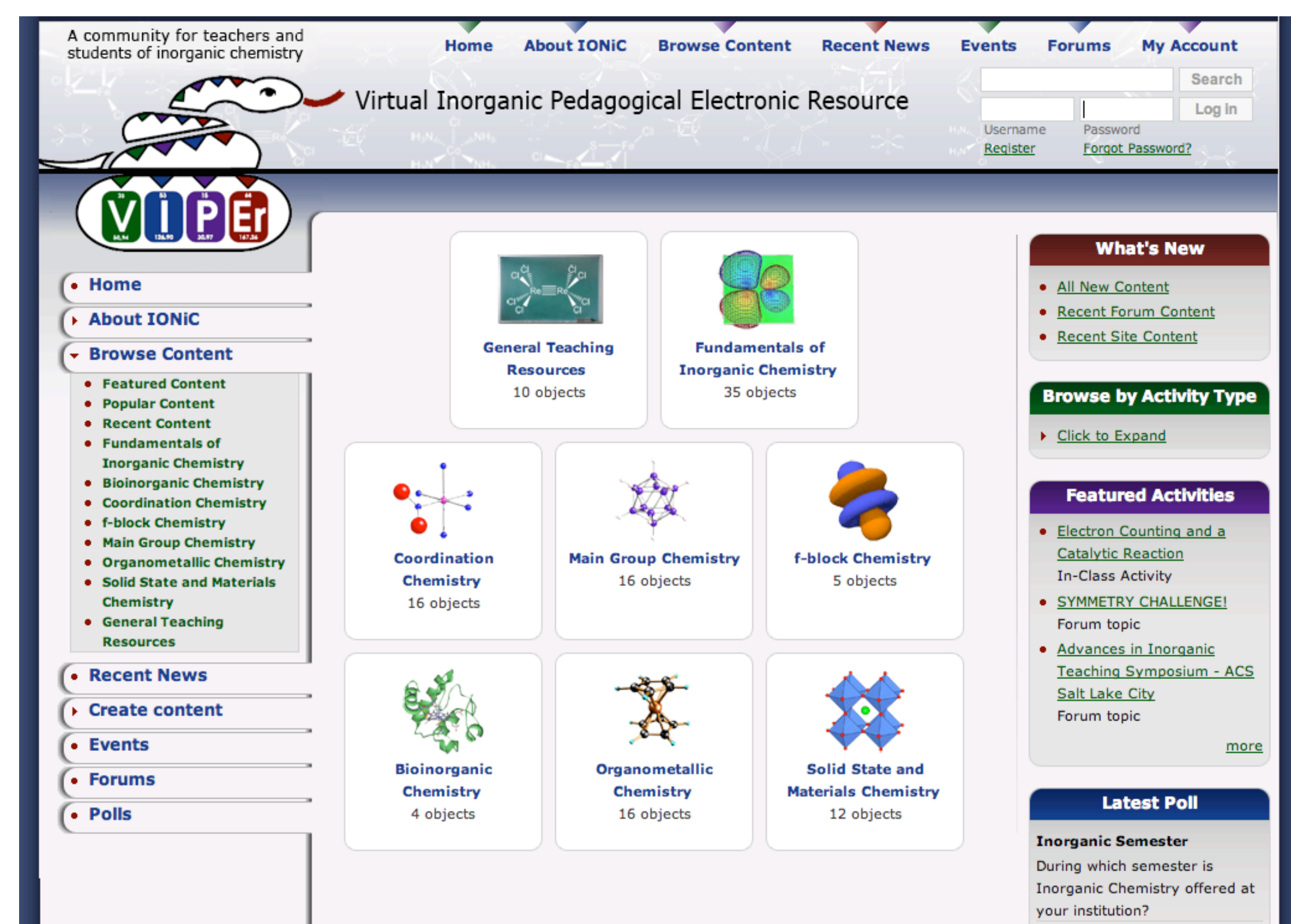
Funding and Technical Support

Private Foundation Inter-institutional Grants for Faculty Enhancement
NITLE Western Regional Instructional Innovation Fund
NSF-CCLI Phase 1 (DUE-0737030)

Donna Sundre, James Madison University, Assessment
Grand Junction Design, Web design and programming
David Lopatto, Grinnell College, Assessment
John Moore, JCE, ChemEd DL
Longsight, Web programming
Kenneth Morrell, Sunoikis
Jeff Fisher, Logomotives
Michael Nanfita, NITLE
Rebecca Davis, NITLE



Building a community with long spiky tails



Activity Types

180+ unique learning objects
>7,000 downloads

- Five Slides About
- In-Class Activity
- Lab Experiment
- Literature Discussion
- Problem Set
- Textbook
- Web Resources

Join the Community

250+ Inorganic Chemistry faculty and growing

- Ask for swag
- Register as a user
- Join in user forums
- Share links & comment on web resources
- Rate your (favorite) textbooks
- Respond to a poll
- Download teaching & learning materials
- Use materials, rate & comment on implementation
- Contribute learning objects for community use
- Become a reviewer

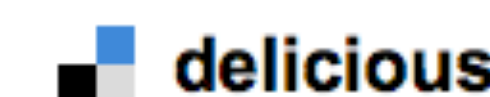
Harnessing Web 2.0 Interactivity Tools

- Commenting
- Rating
- Versioning
- Forums
- Polls

Using Emerging Communication Technologies



Skype
GoogleDocs
wikis & blogs
Creative Commons
delicious



How molecular orbitals change as atomic energy levels shift

View Edit Revisions Track Moderation

Object Type: Web Resources

Posted March 11th, 2009 by William F Coleman Wellesley College

Last updated: March 11, 2009.

- Subdiscipline: Fundamentals of Inorganic Chemistry
- Course Level: Second year Upper Division
- Topics Covered: Periodic trends Bonding models; Discrete molecules
- Prerequisites: General Chemistry

Description:

Over the years I have developed a number of interactive tools that I use in my classes. This is a tool that seems appropriate for VIPeR. Comments are always appreciated, and I am always interested in developing new tools if there is something you might find useful.

This tool allows you to look at how molecular orbitals change as the difference in electronegativities of the parent atomic orbitals increases.

Web Resources:
<http://www.wellesley.edu/Chemistry/Flick/chem341/mocovtoionic.html>

Your vote:

Average: 4.8 (5 votes)

Add new comment | 75 reads | Subscribe

can't wait to try it in class!

Although I haven't used it in class, this looks like it will be really helpful having students internalize what happens to energy levels as you go from same energy / same atom (covalent) to very different atoms (ionic). While I can draw pictures on the board in class, watching it change over time clarifies what happens with the electrons. We'll see if my students agree next year.

Barbara Reisner James Madison University Mar 11, 05:29 PM

delete edit reply

Effect on orbital shapes

This does look great! And just in time to use in class tomorrow.

I think a great addition would be to couple this with images showing how the molecular orbital probability distributions change as one particular atomic orbital begins to dominate in the molecular orbital.

Maggie Geselbracht Reed College Mar 13, 01:11 AM

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Putting electrochemistry to use: Design of new lithium-ion battery anodes

Object Type: Literature Discussion

Posted November 28th, 2008 by Maggie Geselbracht Reed College

Last updated: December 13, 2008.

- Subdiscipline: Solid State and Materials Chemistry
- Course Level: Upper Division
- Topics Covered: Acid-base chemistry Diffraction Electron transfer Extended structure Physical methods / analytical techniques
- Prerequisites: General Chemistry
- Corequisites: none
- Type of paper: Journal Article

Description:

This learning object focuses on a discussion of a recent paper that highlights the application of electrochemistry in inorganic materials chemistry: "Direct Electrodeposition of Cu₂Sb for Lithium-Ion Battery Anodes" by James M. Mosby and Amy L. Prieto, *J. Am. Chem. Soc.* **2008**, *130*, 10656-10661. This article describes the current challenges to designing new lithium ion battery anodes and the use of cyclic voltammetry and electrodeposition to prepare the intermetallic anode material, Cu₂Sb, in crystalline form directly from aqueous solutions of copper(II) and antimony(III).

Learning Goals:

A student should be able to explain the chemistry behind how a lithium ion battery works, the limitations of current materials, and gain perspective on some of the materials challenges involved in making a better lithium battery.

A student should be able to interpret the cyclic voltammetry data that is presented, understand the authors' conclusions, and apply their knowledge to explain how the reduction potential of species in solution can be shifted by either changing pH or by the addition of complexing agents.

A student should be able to explain the advantages and disadvantages of electrodeposition as a materials synthesis technique including the choice of whether to use controlled potential electrolysis or controlled current electrolysis.

A student should be able to describe the additional analytical techniques, X-ray powder diffraction and X-ray photoelectron spectroscopy, used to characterize the materials discussed in this paper and interpret the value added by these experimental results.

Implementation Notes:

I have used this paper as a basis of an oral exam that focused on a current paper from the inorganic literature, drawing questions from the list of discussion questions as needed. A fellow member of IONiC used this paper as a discussion activity in an Analytical Chemistry and Instrumentation course in the midst of a unit on electrochemistry. In this case, he divided up the discussion questions between different pairs of students to present during class.

Time Required:

1 hr

Web Resources:

[J. Am. Chem. Soc. 2008, 130, 10656-10661](#)

Evaluation

Evaluation Methods:

The students are assessed through the performance task of answering one or more of the discussion questions included as a separate document.

Your vote:

Average: 4.3 (4 votes)

Attachment

Discussion questions for literature paper 29 KB

Add new comment | Subscribe

junior level analytical course

Our intro to analytical course is also "baby" inorganic, lots of aqueous inorganic, acid base, equilibria, e-chem. I used this learning object in my course as a review/preview of coming attractions. The students did very well on the assignment. I divided up the 10 or so questions from the handout into pairs of students, and we spent a whole class period spending about 5 minutes per question with the students at the board. I think it worked well, and I've been able to refer back to the paper a few times as I introduced more topics (electrodeposition and CV particularly).

Adam R. Johnson Harvey Mudd College Dec 3, 08:39 PM

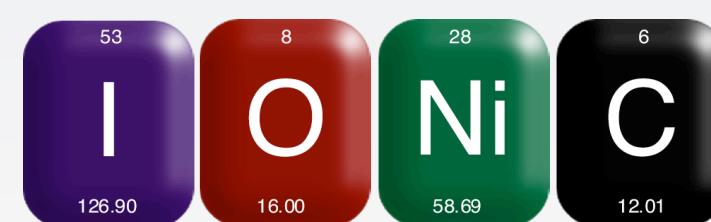
reply

Community Awareness

J Chem Ed VIPeR column

- Highlights of VIPeR learning objects
- Author submitted
- Peer reviewed
- JCE TOC & Chemical Abstracts citation

A project of



The Interactive Online Network of Inorganic Chemists

A partner of

