



2004 Annual Meeting Report

The 52nd Meeting of MACLAC

Green Chemistry

Clark College

October 15 – 16, 2004

General Session 1 – Friday Afternoon

The meeting at Clarke College opened with the traditional welcoming remarks and announcements. Mary Kirchhoff, Education Division of the American Chemical Society presented a talk entitled *Going Green: Integrating Green Chemistry into the Laboratory and Classroom*. The goals are to reduce or eliminate the use and generation of hazardous substances as much as possible. Green chemistry can be incorporated by the development of a new course, converting existing experiments into greener versions, or adding green extracurricular activities. Resources to help faculty were presented, including a few books available from the ACS, and a regular column in JCE.

Next Meeting

Lawrence University October 28 - 29, 2004

Exploring Nanoscience from a Chemical Perspective

visit the website – www.mactlac.org

General Session 2 – Friday Evening

The evening seminar presented by John Rosazza, Director for the Center for Biocatalysis and Bioprocessing at the University of Iowa entitles *Biocatalysis and Bioprocessing: Chemicals and Corn!* In biochemistry several enzymes are involved in the metabolism of glucose. A green alternative to our dependence on crude oil as the source of synthetic starting materials is to use plant materials and enzymes to produce the same materials. Plant material is fermented and then bacteria are used to express huge amounts of various metabolites that would normally be expensive to produce by traditional synthetic methods.

General Session 3 – Saturday Morning

The Saturday morning session was a presentation by Larry Koskan President of Global Green Products, on a natural polymer alternative to polyacrylates. Polyaspartic acid is the biopolymer that binds with calcium carbonate to create the matrix found in sea shells. This natural polymer is non-toxic, biodegradable and non-hazardous and it can be used in many applications that traditionally use the more harmful polyacrylates.

MACTLAC General Business Meeting

1. President Larry Ferren opened the general business meeting on Saturday morning and declared a quorum.
2. Susan Klein, Secretary-Treasurer presented the Treasurer's Report – see below for the numbers.
3. New Amendment to the constitution was presented by Larry Ferren. The aim was to realign the State Representative elections so that elections were held while the meeting was being held in those representatives region. The text of the amendment appears below. The amendment passed.

Article IV Section 1: There shall be one Annual Meeting of the Association held on the campus of a college where at least one member resides. The locale of futures meetings shall be set at least one year in advance, two years in advance if possible, upon invitation of the host schools. *In making selections, the Executive Council will act with due regard to schedule meeting in the region of that year's State Representative election.*

Article V Section 3: Each State Representative shall be elected for a three year period. The State Representatives shall be nominated and elected by a caucus of the state's delegation at the Annual Meeting, in groupings as specified below. *The grouping of states for election are: Western Region: Iowa, Minnesota, and Missouri; Central Region: Illinois and Wisconsin; Eastern Region: Indiana and Michigan.*

4. Tracy Thompson (on behalf of Lauralee Guilbault) gave a presentation of Placement office activities. With increasing access to technology fewer people are in need of the traditional services of the placement office, however six persons received (by snail mail) notices of positions available at MACTLAC institutions.
5. Archivist's Report – Tracy Thompson. Next year the archiving of the meeting is going digital, with a planned running slide show of pictures.
6. Web Master's Report – Craig Bieler in absentia. A listserv has been established so MACTLAC members can easily communicate with each other. The instructions were provided in the meeting packet and are reproduced below.
 - To subscribe: Send an email to imailsrv@mactlac.org with the phrase "subscribe mactlacinfo (your full name)" as the body of the letter. Place nothing in the subject.
 - To Post: Send your message to mactlacinfo@mactlac.org
 - To unsubscribe: Send an email to imailsrv@mactlac.org with the phrase 'unsubscribe mactlacinfo' as the body of the letter. Place nothing in the subject.
7. New Honorary Members presented – Alan Hutchcroft, Rockford College
8. New Emeritus Members presented – Alan Hutchcroft, Rockford College; Marvin Dixon, William Jewel College; Ron Richards, Greenville College; Gilbert Cook, Valparaiso University; Tom Hodges, Franklin College; Peter Wickham, Coe College.
9. Karen Nordell, Lawrence University, Wisconsin made announcements and invitations to attend the next meeting (Nanoscience) at her college October 28 – 29, 2005. Future sites for upcoming meetings are in negotiations – 2006 St Marys College, South Bend, IN; 2007 Viterbo University, LaCrosse, WI (count it as Western Region); 2008 need a central region site.
10. Motions were made to instruct the secretary to write letters of appreciation to the outgoing state representatives and officers
11. New State Representatives were introduced and announced.
 - a. Kristy Miller, University of Evansville, IN (two year term)
 - b. Mark Sinton, University of Dubuque, IA (three year term)
 - c. Matt Riehl, Bethany Lutheran College, IA (second term)
 - d. Bernhard Hansert, Westminster College, MO (second term)
12. New Officers Elected
 - David Oostendorp - President Elect
 - Larry Ferren – Secretary/Treasurer
13. Announcements about the procedures for requesting emeritus and honorary status were described.
13. New President, Chris vanOrman, Hillsdale College, MI began his new term.
14. Door prizes were drawn and awarded.

Treasurer's Report

September 1, 2003 – August 31, 2004

MACTLAC ASSETS (9/1/03):

Checking Account	\$1708.33
Savings	\$5420.19
TOTAL	\$7128.52

INCOME:

Interest	70.66
Dues	426.00
University of Evansville meeting	2118.00
TOTAL	\$2614.66

EXPENSES:

University of Evansville meeting	2447.90
Placement, Archivist	150.00
Postage, Duplicating, Website	306.50
TOTAL	2904.40

MACTLAC ASSETS (8/31/04)

6838.78

AN DECREASE OF \$289.74

Discussion Group Reports

Discussion Group A – Discussion with Mary Kirchhoff

Leader: Daniel Steffenson

Recorder: Chris VanOrman, Hillsdale College

Started with introductions and any application of green chemistry in our departments

- About two thirds use green chemistry extensively, others wanted to learn more and incorporate it into their curriculum.
- Organic chemists have used it more extensively.

At University of Oregon – uses green chemistry and can do synthesis of organic compounds without the need of a hood and smaller amounts of waste.

How does green chemistry fit in with microscale?

- Mary – does not consider microscale green because they have not changed the chemistry to make it more environmentally friendly. If you have to use hazardous materials, then use microscale. University of Oregon went green so they could go back to macroscale.
- There needs to be a balance between experiments that use green chemistry and other experiments that may not be green but teach and important principle (RXN, but if they can be “greener” it is best for the environment). Need to weigh risk vs. exposure.
- Risk is lowered when using green chemistry and exposure is reduced when using microscale.

There are exciting new ways to synthesize compounds that minimize both risk and exposure.

Mary is trying to get editors together to incorporate concepts like green chemistry, nanotechnology, toxicology, etc, into mainstream texts. This is where real changed could take place

Environmental science programs and chemistry programs can both use green chemistry as an interdisciplinary approach.

Mary wants to know what ACS should do to help out with green chemistry?

Answers/Concerns

- Chemists code of conduct—available to help educate
- Environmental chemistry is not all green but Colin Baird does have an environmental text which is all green.
- Need more funding to facilitate green chemistry

- Only one designated program
- PRF will fund green chemistry
- Continue to work with editors but a clearing house of green experience would be helpful.
 - Julie Haack at the University of Oregon is starting this
- Workshops for course development need to be offered more often
 - Only 15-20 people are trained at the University of Oregon
 - Need more funding

Discussion Group B – Dealing with Diverse Mathematics Preparation in General Chemistry

Leader: Mike Collins, Viterbo University

Recorder: Cindy Woodbridge, Hillsdale College

Mike Collins proposed this session because of problems seen at Viterbo, re: changing background and requirements for success in General Chemistry. Students need to place at PreCalc to be successful in the course.

Observations regarding experience / changes in preparation

- Placement administered at college but background looked at; students have taken Calculus but lack basic algebra skills, therefore College Algebra required for General Chemistry.
- Algebra seems to be an indicator for success in General Chemistry
- Calculator issues e.g. graphing is “easy” on calculator but can’t be done without calculator; seems to be too much reliance on calculators; students can’t tell when answer is correct.
- “Math for Science” course? What would Chemistry, Biology, Physics want in? Graphs, trigs, estimation, algebra, word problems, understanding symbols.
- Is there more global problem eg. Elimination of rote memory / drill and focus on creativity.
- “Simple” calculations okay, e.g. 50%, 25% okay but 37% problematic
- Do high schools know about these problems? Is curriculum / focus too advanced such that basics are being overlooked? Are high school evaluations contributing?
- Are problems being exacerbated by professional organizations e.g. ACS, APS? Too much being pushed too early?
- “Too much” basic algebra (manipulations, logs, etc.) being taught / dealt with in the General Chemistry curriculum.
- What skills are emphasized on SAT/ACT? High Schools most likely gear curriculum towards standardized tests.
- Separate issues with students who will never take calculus being in same classes

- Students taught to solve problems (e.g. quadratic equations) using graphs / graphing calculators and therefore don't really know how to solve the problem. Graphing vs. algebraic solutions.
- Require students to use certain low-level calculators in Chemistry (esp. General Chemistry) curriculum. Requires more work to be shown than graphing calculators.
- "Heavy math" in second semester. First year = General / Organic.
- What can MATLAC do? Open letter to (e.g.) ACS—observations with regard to these issues.
- Separate math pretest in Chemistry to focus on / identify students who have problems.
- Relationship between fractions and units – students who struggle with fractions are going to have similar problems with dimensional analysis.
- Skills need to be continually used / reinforced.
- Math without context, e.g. significant figures in math courses vs. applied to measurements.
- When doing examples, ask students to estimate answer.
- George Bodner at Purdue – math tests (17 q.) for placement.
- Package = ALEKS drills/training in basic skills.
- Calculus might be more useful for sophomores.

Discussion Group C – Juggling family/faculty responsibilities

Leader: Dave Oostendorp

Recorder: Joe Ritter

- Introductions and shared backgrounds and family situations
- Issues: Children, Spouse working or traveling
- Push by society of women who are good in math and science into careers in science and engineering without any discussion of family issues/sacrifices that may need to be made.
- Need to work after the kids go to sleep.
- Recommend making time for your spouse—reserve one hour per week (at least). Or meet for lunch.
- Importance of saying "no"—especially after receiving tenure.
- Value of having a boss/department chair who also has a family.
- Research senior project has been transferred at times to similar internship programs.
- There is no check on faculty time—only add tasks and responsibilities, nothing is taken away.
- Make sure we have time for our students and fellow faculty.
- Four hours of prep per hour in class (at least initially—several members disagree that it takes this long).

- More senior faculty said that they no longer are able to spend the time that they would like to prep for classes.
- Teach subjects that you are interested in so it is easier for you to teach.
- Prep time will take as much time as you have.
- In reality, you seldom have time to create new classes except on the fly.
- Some institutions realize that new faculty are often the ones that need release time or even pre-tenure sabbaticals.
- Going to conferences—how do you do it? Support by spouse, grandparents, take kids with you to help session, tests.
- Look for places where you can cut activities, say no to certain activities.
- Define parameters and limitations with department chair clearly.

Discussion Group D – Distance Learning

Leader: Margaret Leggs

Recorder: Joe Ward

Lake Michigan – Online Organic

Blackboard

Post Powerpoint slides online

Online Chapter Quizzes and Exams

Communicate via email

Meet every second Saturday 8am-6pm

Mid term and final exams are physical meetings

General Chemistry – 5 years

Do not recommend students take it this way

Lacks interaction

Non-traditional niche

Saturday labs – three labs per Saturday

Grades tend to be A, B or fail

Discipline of the students—want it and do well

Others think it will be easier and fail.

Can be time consuming if students want to communicate often

Equivalent contact hours

UW-Superior - uses "desire to learn" as repository

Use pool questions

Multiple attempts at online quiz

Save last attempt only of online quiz

Liberal Arts Chemistry

Distance learning OF a course

That is essentially a course

On evaluating research _____ (?)

Reliability (peer review vs. popular news)

Can this be done?

Is the lack of personal communications a major issue?

Distance learning has a long way to go, but there is a need from the non-traditional students.

Lake Michigan – Does not encourage. Requires students to meet with prof first to ensure this is the only way the student can complete a required course. Self-discipline is required.

Are we doing students a service if many will not complete the course?

J. Chem. Ed. has a bank of questions – QBank. Can use with cost \$20. Download Call online quizzes homework instead.

Online discussion removes the time flexibility that makes the course attractive to non-traditional students.

If interaction was not needed then why are the instructors needed with textbooks with interactive CD's.

Discussion Group E – Grants and Grant Writing

Leader: Jeffrey Cornelius

Recorder: Mary Ellen Biggin

Interests of Attendees

First we discussed what funding each person/institution has received and what type of funding we were each looking for. A number of attendees were new faculty members and interested in starting out in grant writing. A large number of attendees were interested in obtaining funding for instrumentation.

New faculty – sources of funding

- ACS starter grant (PRF)
- Research corporation
- Dreyfus (nominated by institution)

*excellent resource – CUR & NSF workshops

*can take a look at funded proposals (Fast Lane)

Institutional Support

- Grant writing officer
- Funding to attend grant writing workshop

Assessment

- Surveys

Sources of Funding

- Merck Biology – stipend
- CCLI
- NSF – MRI
- Pittcon

Major Research Instrumentation (MRI)

- Research institutions separate from primarily undergraduate institutions
- Outreach is important (supposedly weighted 50%)

*smaller colleges in area

Piggyback onto Major Research Institution's grant

- Major Research Institution's outreach

We generated a list of recent funding of attendees.

<u>Name</u>	<u>Recent Funding</u>
Craig Teague	Iowa College Fund Collaborated on NSF, MRI NSF – MRI research grants for NMR
Mary Ellen Biggin & CG-MS	PRF, Research Corp.
Peter Walhust	PRF (G)
Elizabeth Trimmer	new faculty
Kristy Miller	Iowa Collge Fund (McElroy Trust)
Erik Olson	MRI Bio
David Speckhard	Research Corp
Glen Frerichs	PRF – Type B

Discussion Group F – Generation Next

Leader: Karen Glover, Clarke College

Recorder: Susan Klein, Manchester College

Handout provided – Mark Taylor, Generation Next. Taylor doesn't want to classify or stereotype vs. Howe's Theory Millenials.

Parents are hover/helicopter parents. Small number of traditional family.

Additional Issues:

- Increasing amounts of ADD or ADHD
- Students often have a lot of family responsibilities
- Often have a full time job
- Larger numbers of learning disabilities

Should we adapt to them entirely, or should they have to adapt to us too?
Variety of learning styles.

In some cases, the group learning doesn't seem to make much of a difference. If it doesn't do anything, why do it?

Many educators want to find ways to engage large class sizes. This doesn't help us.

What if students don't want to adapt to us?

Parker Palmer – Authentic to your own style.

Discussion Group G – Discussion with Mary Kirchoff and Green Chemistry in Organic and Biochemistry

Leader: Gene Losey

Recorder: Dora Peelen

Questions:

- How to incorporate Green Chemistry in Organic labs?
- How to use transition metals in Green Chemistry?

St. Olaf Collage – 2nd year of incorporating green chemistry in Organic lab.

- Need more suitable Green Chemistry lab experiments.
- Reducing costs through waste reduction is a current theme.

Is there money for developing Green Chemistry?

Research funding: Technology for a Sustainable Environment (TSE) Program.

- PRF encourages green chemistry submissions
- Research Corporation has also previously supported.
- W.M. Keck Foundation (also may be good for curriculum projects)
- Also may want to try local corporations/foundations, especially companies that are Presidential Green Chemistry Award Winners.

Green Chemistry in First Semester Organic Labs.

- Maintain traditional teaching of techniques while still being green.
- Ex. Column chromatography of spinach extract small scale in Pasteur pipettes.

Should we be developing to Green Chemistry experiments? How?

- Gary Spessard, St. Olaf – Green Chemistry is exciting – think about new chemistry.
- Ionic liquids as alternatives to alkanes/halogenate solvent.

George Bennet, Millikin: Modify existing experiments based on 12 principles of Green Chemistry.

- Apply results from research literature, apply to new experiments.

Are there workshops in Green Chemistry?

- NSF-sponsored workshop or University of Oregon

Green Chemistry on Microscale?

- No compilations of experiments yet
- Tom Goodwin – Hendrix College, Conway, AR has done some work.

Mary: What types of workshops should be available?

- More workshops of shorter length
- Create listserve?
 - Compilation of lab experiments from U. Oregon.

Issues raised with Green Chemistry and building renovations.

- How many hoods needed? Will Green Chemistry obviate the need for a large number of hoods.
 - Lower installation costs
 - Lower maintenance costs (heating)
 - Less noise, better sight lines.

Will biology begin to play stronger role as Green Chemistry takes hold? Mary thinks so.

Industry seems to be leading the way in Green Chemistry. Increasingly looking for mindset of Green Chemists.

For information on incorporating Green Chemistry

George Bennett – Millikin University, gbennett@mail.millikin.edu

Gary Spessard – St. Olaf, spessard@stolaf.edu

Discussion Group H – Characteristics of Generation Next and its Implications

Leader: Glen Frierichs

Recorder: John Hanson

Copies of paper Generation Next comes to College: Meeting the Postmodern Student, by Mark Taylor, were on the table as we came into the room. People started reading the paper. As discussion began, the MATLAC teachers described characteristics of current students they have observed:

- Students are more interested in grades than knowledge, learning
- Students in class behave as if the teacher is on TV and can't see them.
- Many students are first in their family to go to college.

- Many are oldest children in their family.
- Students are more interested in service and humanities studies than in basic science.
- CSI-type programs impact their image of forensic science.
- Thought processes are not connected, or related well. There is a lack of real life observations, connections with the physical world.
- An experiment using a 2-liter bottle fitted with a teri valve exploring the relationship between pressure and mass was described. Students were surprised somewhat by the simple relationship observed.
- Issues affecting student perspectives were mentioned: consumer orientation, need for instant gratification, information overload.

The paper afforded some suggestions for postmodern pedagogy. These were discussed briefly.

Discussion Group I – What can MATLAC do for your faculty?

Leader: Fred Hadley

Recorder: Mark Sinton

- Can MATLAC draft open letter to state education officials/teachers at high schools concerning poor math skills of incoming college students?
- ACS certification options? Requirements are difficult for small schools.
- Can MATLAC be a clearing house for upper division courses – share students/faculty by distance education with payment reimbursement?
- Can MATLAC do a certification program for small schools?
- Could MATLAC design/administer a set of assessment exams different from ACS that take into account our small school?
- Could MATLAC as ACS do this? Or could we ask the Professional Training ACS committee to deal with the 2 major tracks of most small school chemistry programs (chemistry vs. biochemistry)
- MATLAC needs more teachers to present info to all (i.e. more sessions): new teachers, established teachers and outreach (MATLAC needs to be more of a clearing house of infor).
- Process for making MATLAC assessment exams-
 - Survey of support
 - Create task force to meet after meeting on Saturdays (this will take several years)
 - Roll out at selected schools
 - Roll out at all schools
 - Note – test should only be for core courses, so we would have to decide what was core.
 - Note – we would need to figure out the logistics of all this
 - Could we get outside money to do this (ACS or North Central)?
- MATLAC generated lab manual/test?
 - Cheaper

- Better experiments
- Perhaps this could again be done as a MATLAC clearing house function via MATLAC website.
- Better communication between MATLAC members.
- MATLAC needs to recruit more members/have greater attendance at meetings.
 - Can intended survey find out this information?
 - Could MATLAC expand its region into Ohio (have an eastern and a western MATLAC region)?
 - Move meeting date to avoid other meetings/events?
 - Could MATLAC expand to schools in current region to schools not currently represented at MATLAC?

Session J – Writing in the Chemistry Curriculum

Leader: Roger Kugel, St. Mary's

Recorder: Cindy Woodbridge, Hillsdale College

“Writing Intensive” Components:

Viterbo – Research, Advanced Inorganic (General Chemistry writes formal lab reports)); feedback mechanism included, peer review and revisions incorporated.

Principia – 6 phase program, at majors, turn in portfolio which includes lab report; research (lit) paper; capstone = thesis project; first three phases in early part of career, last three in major.

- Organic paper with presentations. Rewrites required and grade includes how well comments from previous draft addressed. Includes progression of deadlines e.g. topic, bibliography.

- Reflective writing => give one paragraph response to grade on (e.g.) lab reports. Seems to be effective.
- Need recognition that lab reports count as writing.
- Breaking assignments up into pieces seems to help – students aren't “aware” that these projects should be read over before submission.
- Hard to draw the line between writing/correcting for them and guiding them with helpful comments.
- Describe a demonstration, limit = one page.
- Gear writing towards audience e.g. letter to lawyer re: whether will is forgery as evidenced by TLC analysis; consumer report on toothpaste. Include background letterhead.
- Format requirements are different in e.g., biology and chemistry.
- St. Mary's: in Gen. Chem. Get students to focus on audience, lab reports based on letter from client with particular problem. Must return report with cover letter.

- Collaborative labs – contract where all roles are assigned, one lab report with cover letter for team. Roles rotate on each project. Component of self evaluation and peer evaluation.
- Students don't write letters in college – write a formal letter to (e.g.) the President about topic covered in class and letters are mailed. Grade based on grammar/spelling and not content.

Discussion Group K – Alternative or Innovative Education Courses in Chemistry

Leader: Vanessa McAffrey

Recorder: Laura Southworth

- Get rid of textbook – students think that it means scientists have all the answers, and they are in the book.
- As students to go find something on their own – teach students to evaluate their sources – hardest part for teachers is coming up with the question – practical applications drive the class to evaluate – turn in sources and brief summary and reliability of source
- Learning communities being stressed – same courses but change structure
- Non-major courses are usually pushed onto you because no one else wants them but it allows more innovation, be creative.
- Chemistry of color – fireworks, gemstones – organic and inorganic.
- Chemistry of art, history of chemistry.
- Courses between two departments – chemistry of environment – work with geology
- Science of bread making.
- NSF workshop in Penn., Millersville – Chemistry of Art Workshop
- Scientific investigation of Shroud of Turin.
- One semester courses, with as much chemistry as possible.
- Chemistry of Art – learning community with Art department – take 2 courses – 2 dimension art class and chemistry of art – all students are art majors
 - Field trip to paint manufacturer
 - As little math as possible
 - Focus is on concept, what's going on
 - Goal – make students a little more aware of things read in newspaper to ask intelligent questions
- Tug of war with biology for enrollment
 - Creative titles to attract non-majors to chemistry
- Most of these classes are electives, but somewhat required to meet a certain “code”

- Presentations at end – write a paper, put up a display – got students not in class to come listen to presentation
- Forensics science – “Real life CSI”
- Environmental – starts off with 2-4 minute presentations by students, take students presentations and expand on chemistry issues – put questions on test relating to presentation
- There is enough chemistry in the class to be used as a stepping stone to get to majors, chem. If they want Chem major but aren't ready for general Chem – some students become chem majors after these classes.

How do you teach these classes?

- Lab based class/activities – 12-30 minute intro, 1 hr in lab, 30 min debrief – evaluate lab results, give tests – haven't found a way to evaluate just on labs
- Choose a topic that is controversial – assigned to group – research, then present sides, present at end – get graded based on presentation – individual grades – not all group members get same grade – students like it most – meet with groups throughout quarter
- First half is “lectures,” second half of quarter is all presentations
- We are told students can't focus for more than 50 minutes – need to divide up/break up class
 - Use clickers – ask questions, break up lecture, can see if they understand
- What happens if students bring up things you don't know?
 - Say you don't know/be honest
 - Tell them to look it up to find reliable resources.
 - § Present to class next day
 - § Need to have a basis to know if they answer is right

Where does funding come from?

- Chemistry department
- Some supplies come out of general budget since it meets gen. ed. requirements

Discussion Group M – Discussion With John Rosazza & Larry Koskan

Leader: Mark Sinton

Recorder: George Bennett

Question 1: Best coursework for students interested in biotech?
Hybrid background is best (i.e. interdisciplinary courses)

Question 2: Are there positions for BA people?

Yes (summer internships, too)

Question 3: Internships for undergraduate students?

Yes

Question 4: Is Iowa ahead of the game in state support, or do other states have similar efforts?

Unfamiliar with details, but certainly efforts exist in CA, MI, IL, etc.

Koskan: one IL state agency helps choose location

IL has "moral obligation" bond issue program

Question 5: What is latest science & politics re: ethanol?

Koskan: subsidy is 70¢/gal (driven by adm)

Question 6: How does cost of ethanol by fermentation compare to formation from ethylene?

Ethylene was by-product of tetraethyl lead formation, which has dried up Chinese production of ethanol, aspartic acid, etc (but no or little environmental management). However, US and Euro company expansion into China is bringing pollution control.

Koskan – people are not moving business to China because of cost of labor but rather because of cost of materials and methods.

Question 7: When does a subsidy become a tariff?

Koskan: description of activities as ACS lobbyist

e.g., use of crosslinked polyaspartic acid to prevent forest fires.

Conclusion, can't find single person in Washington, D.C. to talk to, too many people to talk to for one lobbyist

e.g., green chemistry bill that passed house but awaits senate passage

Question 8: Are there any strong biodegradable polymers?

Koskan: Journal of Biodegradable Polymers

Effort is to engineer organisms to degrade plastics

Rosazza: this effort works in labs but has not been viable on large scale

Koskan: analogy to 1,3-propanediol process (Green Chem challenge award)

Rosazza: several technologies already developed but not commercialized yet

Question 9: Use of TPS by US Navy? Not so much as anti-barnacle coatings

Rosazza: Offsetting existing technology is huge hurdle to overcome

Koskan: e.g., North Sea has 550 oil platforms, BP has 120 of them, TPA used on 10 of BP's platforms

Question 10: are there medical equivalents of anti-corrosion agents (for gout prevention, arterial plaque prevention, etc)?

Heparin coatings, early work on polyasp and polyglu

Discussion Group O – Outreach Issues – Recruiting Chemistry Majors

Leader: Michelle Applebee

Recorder: Michelle Applebee

Freshmen

- Get to know high school councilors/coaches
- Feeder schools/faculty letters with "gift" (periodic table with college name)
- Successful? Not sure
- Use secondary ed. alum for promising students
- Olympiad involvement
- Professional society/High School science teachers – conference
- Demo night
- Workshops for High School
- Mole Day/National Chemistry Week
- Science Open house
- Research is ongoing
- Activities
- Seminars
- Strong affiliates/chem. Club
- Peer tutoring/lab assistants (personal interactions)

Converts

- Offer up the option/personal approach
- Double major (BioChem emphasis of Chem major), joint major (6 classes Bio, 6 classes Chem) Bio-Chem degree, all pre-allied health
- Scholarship packages as incentives
 - Book awards
 - Just reduces financial aid

Biochem majors

- End result: ½ med school/pre-allied health
½ industry/pharm. sales

Biochem – emphasis @ Manchester

- Chem major/Biochem – grad school (not med.)
- After PChem – below them

Discussion Group P – Molecular Molding

Leader: Gene Losey

Recorder: Kimberly Lawler-Sagarin

Are there user-friendly protein modeling software packages?

- Free:
 - Protein explore – Eric Martz, UMass, online tutorials, web based
 - Autodoc – from Scripps, free, viewing, simulated docking
 - Swiss pdb viewer (deepview) – Gale Rhodes, Univ. Southern Maine, online tutorial
- Cache has some capabilities for proteins but is expensive (no one here has tried it)

Site License

- Suggestion to contact manufacturers for extended site licenses where several schools ban together to purchase one license.

Types of exercises

- Organic – AHF's of cyclohexane
Substituted butanes
Dipole moments for TLC
Suggestion: solve problems don't just build structures
Question: how much background to give in organic?
 - molecular mechanics basic background OK, probably more than that would be too much
- Research – Q: with undergrads, what background?
 - one gives basic MO theory book
 - Q: Approaches?
 - molecular docking experiments
 - QSAR, leading to synthesis

When to introduce molecular modeling

- Some introduce to freshmen
 - In lab, about one lab session average
 - Helps if they have already done it when they get to organic
 - Used primarily for VSEPR theory
 - Problem: too few stations, but ways around this – helps to have good TA, inexpensive hand-me-down computers
- Do more than just “play” with tutorials
 - Must have questions for students to answer

Other Program:

“Know it all” – draws spectral simulation

ISIS draw – free site license – draws mes-rec (free, will do spectral manipulation)

Spectral Libraries/simulators – ACD, GNMR, Aldrich Library

Discussion Group Q – Green Chemistry – Analytical, Inorganic, Physical

Leader: Mark Nussbaum

Recorder: Bill Morrison

What are we doing?

- Recover silver waste from silver chloride and process back to silver nitrate
- Downsizing in lab – microscale – not everyone likes this
- Using calcium oxalate ppt instead of lead iodide
- Doing away with mercury thermometers –going digital
- Ordering smaller amounts of materials
- Asking questions about why we use traditional methods when more benign materials will work.

What could we do?

- Solid phase extractions to avoid solvent use
- Alternative cleaning baths instead of chromic acid
- Reuse some solutions and reagents instead of disposal
- Discussion of waste disposal issues with students

What about lectures ... what are you teaching about green chemistry?

- Apparently not much in many cases

What can we do to make lecture and lab more environmentally friendly and more appealing to non-majors?

- Make ice cream in lecture
- Caloric content of foods
- Focus more on how chemistry solves problems, instead of just creating them.
- Minimize energy use
- Students can look at web sites dedicated to reporting environmental factors such as climate, UV levels, pollutants, etc.

Discussion Group R – Effective Digital Classroom Applications

Leader: Larry Ferren

Recorder: Todd Miller

Larry – Starting with Powerpoint

Afraid students won't take notes / only on slides

Movies / animations incorporated
Poor movies available from publishers

Powerpoint advantage
Can allow students to listen (post before or after)
Posted with 3 slides per page
Some say they need to write it down

McGill U. – can see slides used in class with recording of what was said for each slide
Claim no effect on attendance
J. Chem. Ed.

Blackboard – 2
WebCT – 2
Angel – 2

Feedback in P-Chem positive
Microscope has drawing tools
Google – image search, can give web address
Equations – use equations editors
Can be painful at first, but subsequent
Commercially available – from publishers, but not very good
Organic reactions – can be done in other program, then cut and paste
MDL – ISIS has free version
Chemsketch – free

In one case, the students preferred chalk-talk to PowerPoint
Need to have a plan B in case of technical problems
Some give full notes, others give outline or definitions

Internet problems
ChemSkills – assign certain problems, immediate feedback
WebAssign – has problems from various texts (good feedback)
E-grade (or PHgrade assist depending on publisher)
May have a nominal fee per student
Chem Skill Builder – if text is adopted
Using problems on text website – bet can get email from each student
Chem in context – good website, some problems need web

Animations
Good sites?
Those that come with text not impressive
Available from JCT (CD for approx \$50)

Biology
Series of questions posed on Blackboard
Students answer and lecture tailored to areas of trouble
One person is coming close
Quiz given before class, covering more basic skills
Need to look at where people need help
“pre-lecture” exam
Try to encourage self-learning

Chatroom
At University of Iowa, using it as a virtual office hours
Not sure how successful

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