"DANCING" LESSONS

Teaching non-chemist librarians to communicate with chemists

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IN THE BEGINNING

**SLA Mission:** The Special Libraries Association promotes and strengthens its members through learning, advocacy, and networking initiatives.

https://www.sla.org/about-sla/vision-mission-core-value/

“A primary goal of the Chemistry Division is to provide educational opportunities both to its members and to the Association at large.”

*SLA Chemistry Division CE course proposal document*
Locating chemical information should be a partnership between Chemist and Librarian. Chemists are experts on chemistry aspect of search, while Librarians are experts on information retrieval. However, this assumes a level of shared language and understanding of each other’s work.
I’m looking for examples of reactions in which the metal is oxidized from the +3 to the +4 oxidation state. I’ve been very specific. Why is this so hard???

I have absolutely no idea what you just said or what you want, I see you getting frustrated, and I have no idea what to do next!
TEACHING BOTH PARTNERS TO DANCE

- Historical focus of chemical information short courses
  - How do we teach chemists to use the literature?
  - How do we teach chemists to teach their students to use the literature?
    - “Teaching Chemical Information” short course at ACS
    - SLA Chemistry offered a similar short course in 1998

- Addresses gaps in chemists’ understanding of information systems, but not librarians’ understanding of basic chemistry
TEACHING BOTH PARTNERS TO DANCE

Chemistry and Chemical Librarianship for Non-Chemists

- World premier: 1999 SLA Annual Conference, Minneapolis
  - 4-hour CE course attempted to introduce basic principles of chemistry and information sources/retrieval
    - Substance identification
    - Basics of nomenclature
    - The origins of “The Handout”
  - Taught by Bartow Culp and Dana Roth
- Repeated in 2000 (Philadelphia) 2001 (San Antonio) and 2002 (Los Angeles)
  - Judith Currano joins instructors
  - Introduces “What Chemists REALLY Want,” which attempts to “translate” chemists’ questions into information needs
FOUR HOURS IS NOT ENOUGH TIME

Introducing Chemistry for the Non-Chemist Librarian

“This course is intended for information professionals, with either new or continuing responsibilities for chemistry reference work, who have had minimal chemistry course work. It is recommended that participants also enroll in the Chemical Information Sources, Requests, and Reference to gain an understanding of the major tools in chemical information retrieval.”

1) Introduction to the five traditional divisions of chemistry and the questions that chemists in these divisions seek to answer
2) The language of chemistry: nomenclature, CAS REGISTRY® numbers, structures, and sequences
3) Ways in which chemists’ research needs direct their information needs
CFNCL IS A SUCCESS!

- Addition of hands-on exercises to allow students to practice drawing structures and writing formulae

- Positive comments
  - Great to get a “big picture view” of chemistry
  - Nomenclature, hands-on activities very helpful

- BUT…
FOUR HOURS IS STILL NOT ENOUGH TIME!

2004

- 8-hour course employing plastic molecular models.
- Added a section on polymer chemistry, a nomenclature hands-on activity, and a spectroscopy hands-on activity.

Writing Molecular Formulae for Information Retrieval

Please write the structural and molecular formulae for the following molecules. Remember to put molecular formulae in Hill Order.

<table>
<thead>
<tr>
<th>Substance</th>
<th>Molecular Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HO-CH₂-CH₂-CH₂-CH₂-NH₂</td>
</tr>
</tbody>
</table>

Name That Spectrum!

One of your scientists has taken some spectra of aspirin, and he wants you to compare them to literature spectra. Unfortunately, he has neglected to give you the axis labels or inform you which spectroscopic method he used to take each (typical...). Can you identify the type of spectrum shown in each?
2005: THE CHEMISTRY VERSION OF “TELEPHONE”

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**Tag-Team Event**

*Applying Principles of Nomenclature, Structure-Drawing, and Model-Building*

This is an opportunity to practice building, naming, and drawing compounds, while getting to know your fellow attendees. This activity has three parts. Please follow the instructions in each section of this sheet when you are told to do so by the instructors.

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**STEP 1: Model Building**

Your substance is

**Methyl ethyl ketone**

Using your molecular model kit, build this structure. On the **Key to Model** form that you were given, indicate the type of atom to which each color in your model corresponds. For example:

- Black = Carbon
- Red = Oxygen
- Blue = Nitrogen
- Green balls = Chlorine
- Hydrogen is assumed

Black pieces should represent carbon, but other colors may be whichever atom you like. You may want to omit hydrogen from your structure (in true organic chemist style) because there may not be enough pieces to include it. If so, please indicate this on your **Key to Model** form, as shown in the example above.

When you have finished building your model, please pass the model and the **Key to Model** form to the next group. Be sure to put your name on the **Key to Model** form so that you get your model back.

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**STEP 2: Structure Drawing and Molecular Formula**

Another group has given you its model and **Key to Model** form. Copy the names of the model builders to the appropriate section of the Structure Drawing and Formula form, and then draw a flat representation of the other group’s substance on the form. Remember the drawing conventions: plain single bond appears in the plane of the paper, solid wedge sticks out, hashed wedge sticks behind. After you have drawn the substance, write its molecular formula in correct Hill order. Then, pass the Structure Drawing and Formula form to the next group, being sure to put your names on it. Return the model and the **Key to Model** form to its owners.

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**STEP 3: Nomenclature**

Another group has given you its Structure Drawing and Formula form. Copy the names of the model builders and structure drawers to the appropriate sections of the form below. Then, using the structure that they have drawn, construct an IUPAC name for the substance. Write the name that you have constructed below, and then return the Structure Drawing and Formula form to its owners.

**Names of Model Builders:**

**Names of Structure Drawers:**

**Name of Structure:**

When all groups have finished naming their substances, we will compare the names that were assigned to the model builders for each substance with the name that the nomenclature groups have constructed.
2011: WE TRY TO MAKE IT MORE FUN

- Chromatography exercises integrated
WE TRY TO MAKE IT EVEN MORE FUN: 2012 ITERATION

We institute the Dancing Raisins nucleation experiment and discover that our raisins are wallflowers!

WE TAKE CFNCL ON THE ROAD IN 2013

- *Chemistry for the Non-Chemist Librarian* (Army Proving Ground, Aberdeen): A 1/25 teacher/student ratio is less than ideal!

- Meanwhile, back at SLA, changes to the conference necessitate cutting back to a half day course, during which Sue and I are flabbergasted to discover that...

**FOUR HOURS IS NOT ENOUGH TIME!**
CURRENT COURSE OUTLINE

- Chemistry in context: A brief description of the history and domains of chemistry
- Tools of the trade: the periodic table molecular bonding, moles, formulae, and structures
- What every good information scientists needs to know about important subdisciplines of chemistry
  - Organic chemistry (including nomenclature and stereochemistry)
  - Physical Chemistry (including properties)
  - Analytical chemistry and spectroscopy
  - Inorganic and organometallic chemistry and catalysis
  - Polymer chemistry
  - Biochemistry
HOW TO HELP YOUR NON-CHEMIST LIBRARIAN

- Put your query in context
- Draw it out
- Try to avoid the use of acronyms or chemical shorthand
- Remember to brainstorm a list of synonymous terms
- Be open to and inviting of clarifying questions
- Remember that you may need to give a little explanation of the basics in order to help the librarian frame your query
ACKNOWLEDGEMENTS

- University of Pennsylvania Libraries
- ACS, CINF, and the Philadelphia Local Section
- SLA Chemistry Division
  - Division chairs from 2000 – present
  - Bartow Culp
  - Ted Baldwin
  - Sue Cardinal
- Historical Information
  - Marilynn Dunker
And a Debt of Gratitude to

DANA L. ROTH

Without whom this class would neither exist nor have the stature that it does, nor would I be the librarian I am.