

Chemistry Outlook

An Activity of
The Committee on Chemistry in the Two-Year Colleges
Division of Chemical Education
American Chemical Society

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Neil Bastian Chair

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Notes From The Chair

Neil Bastian
Salt Lake Community College
Salt Lake City, UT

Why are you here? I get that question almost every semester after I introduce myself to my new classes. My first inclination is to say “Because my Dean expects me to show up at class.” Or “Because my wife expects me to bring home a paycheck.” But the response then is “Yes, but why are you **here**?” The implication is that I should want to be somewhere else. I admit that when I moved to my two-year job from a four-year school I took a significant pay cut. And when compared to salaries of other jobs I applied for at the same time I took a significant pay cut. However, for me, the non-financial benefits of teaching at a two-year school far outweigh the financial deficits. So then, why am I here? About a year after I started teaching full-time at Salt Lake Community College (SLCC) my wife pointed out that I seemed less stressed and much happier than I had been before. Let me explain why.

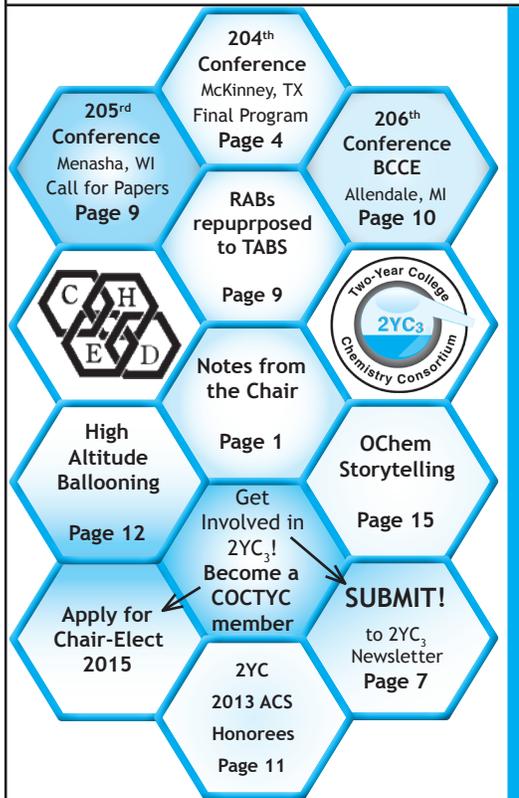
Thinking about why I teach at a two-year college brings to mind the joy on the face of a single mother as she told me that she had just been accepted into pharmacy school. This was a woman who recognized that she needed to make life changes for her own and her children’s sakes. She started school without any real direction because she wasn’t sure what she was capable of accomplishing. After many hours of coaching, tutoring, and encouraging over several years she had realized her dream. She is now in her third year of Pharmacy school and on her way to what will hopefully be a rewarding career.

A second student that comes to mind is a first-generation immigrant whose parents hadn’t attended college. He also was at SLCC hoping

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Vol. 2014 – Issue I



204th CONFERENCE (Southern)

March 14-15, 2014

Collin CollegeMcKinney, TX

Contact: Amina El-Ashmawy

Email: ael-ashmawy@collin.edu

205th CONFERENCE (Midwestern)

May 16-17, 2014

University of Wisconsin-Fox ValleyMenasha, WI

Contact: Kristin Plessel

Email: kristin.plessel@uwc.edu

206th CONFERENCE (Midwestern)

August 3 – 7, 2014

Grand Valley State UniversityAllendale, MI

Contact: Tom Neils

Email: tneils@grcc.edu

“Notes from the Chair” ...continued from page 1

to make a better life for himself. He spoke of friends and former classmates who were gang members, druggies, or prison inmates. He has since moved on continuing his quest to become a functioning member of society.

One recent student to ask me the question was registered in my summer semester organic chemistry II class. I didn't know it at the time but later learned that he had just accepted a job teaching high-school biology. He needed this O-Chem II class so he could also qualify to teach high school chemistry. We had several discussions about his excitement and enthusiasm for teaching and his fear that he wouldn't be able to effectively communicate with his students. I haven't seen him since August but hope he is finding his passion.

I also recall a bright 18-year-old who came to SLCC because she had been homeschooled all her life and had no paper trail of achievement that could get her into the university. After a year of stellar performance at our institution and through connections with

our local four-year institution she moved on to the university with a scholarship for women in STEM disciplines. She has since started medical school and is looking forward to an exciting career.

I could go on but have made my point. Every student has a story, every student wants to succeed. I am proud of my students. I can't do their work for them. Each achieves success on their own through study and hard work. Other than the knowledge that I may have played a small part in their success I gain no benefit from their achievements. But as I look at the many thank-you notes I have posted on my wall and the many lives that I have seen changed for the better by education I think I know the answer to the question. When someone asks, “But, why are you **here**?” I can honestly say, “I am here because I love you guys.”

Over the last couple of years as I have met and talked with other faculty I have found that most two-year college teachers feel as I do. We don't teach for financial rewards or for acclamation or adoration. We teach because we care about our students and their success and their success has become our passion.

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204th 2YC₃ Conference
Final Program

*Creativity and Innovation:
Classroom and Beyond*

March 14-15, 2014
Collin College, Central Park Campus
2200 West University Drive, McKinney, TX 75071

Program Chair: Amina El-Ashmawy AEI-Ashmawy@collin.edu 972.548.6512
Local Arrangements: Dawn Richardson DRichardson@collin.edu 972.377.1633
Exhibits Coordinators: Thomas Jose Thomas.Jose@blinn.edu 979.209.7484

IMPORATANT INFORMATION: To build a rich program and accommodate abstracts submitted after the publication of this newsletter, changes will take place prior to program finalization. Please note that the following is a DRAFT program. Please refer to the conference website for the most up to date information.

Friday, March 14

- 8:00 – 5:00 **Exhibits and Student Posters**
- 8:00 – 8:30 **Registration, Refreshments, Exhibits and Student Posters**
- 8:30 – 8:45 **Collin College Welcome and Opening Remarks**
Dr. Sherry Schumann, Vice President/Provost, Central Park Campus, Collin College
- 8:45 – 9:45 **Keynote Address 1**
Innovation in museums as gateways to engaging in science for all ages
Jennifer Scripps, Vice President of Revenue Operations, The Perot Museum, Dallas, TX
- 9:45 – 9:55 **Refreshment Break, Exhibits and Student Posters**
- 9:55 – 10:25 **2YC₃ General Membership Meeting**
- 10:30 – 11:15 **Parallel Presentation Session 1**
- A. Getting started with undergraduate research the easy way
Heather Sklenicka, Rochester Community and Technical College, Rochester, MN
- B. Transformative teaching and learning: From technology to teams
Cheryl Frech, University of Central Oklahoma, Edmond, OK

11:20 – 12:05 **Parallel Presentation Session 2**

- A. How to maximize your teaching experience at a community college
Sammer Tekarli, Collin College – PRC, Frisco, TX
- B. Unassigned (proposals welcome)

12:05 – 1:00 **Lunch Break, Exhibits, and Student Posters**

1:00 – 1:45 **Parallel Presentation Session 3**

- A. Panel discussion: Acknowledging excellence in chemistry teaching and learning
Annemarie Ross, RIT/NTID, Rochester, NY
- B. Correlation between different online homework systems, student success, and knowledge decay
Blain Mamiya, Independence Community College, Independence, KS

1:50 – 2:35 **Parallel Presentation Session 4**

- A. Student skills: Bridging the gap between student skills and employability
Mary C. Roslonowski, Eastern Florida State College, Melbourne, FL
- B. CASMNS: An interdisciplinary research program at the two year college level
Frederick Jury, Nelson Rich, and Cameron Neal, Collin College – SCC, Plano, TX

2:35 – 3:00 **Refreshment Break, Exhibits and Student Posters**

3:00 – 3:45 **Parallel Presentation Session 5**

- A. Climate science is the answer, but what are the questions?
Robert Landolt, Texas Wesleyan University, Fort Worth, TX
- B. Student preconceptions of chemistry laboratory
Joshua Sisk, University of Texas at Dallas, Dallas, TX

3:50 – 4:35 **Parallel Presentation Session 6**

- A. Tales of chemistry in Texas: The human element
Diana Mason, University of North Texas, Denton, TX
- B. Anyone can do it... the democratization of the distribution of educational tools
Mark Bishop, Monterey Peninsula College, Chiral Publishing Company, Monterey, CA

4:35 – 5:00 **Refreshment Break, Exhibits and Student Posters**

6:00 – 7:00 **Social Hour**

7:00 – 8:30 **Dinner Banquet and Keynote Address 2**

- The Chemistry Enterprise: Do We Have a Future, or What?
William F. Carroll, Jr., VP of Industry Issues, Occidental Chemical Corporation, Dallas, TX

Saturday, March 15

8:30 – 4:00 **Exhibits and Student Posters**

8:00 – 8:30 **Registration and Exhibits**

8:30 – 9:30 **Keynote Address 3**

Education: Opportunities and our responsibilities in and out of the classroom

Bassam Z. Shakhshiri, University of Wisconsin-Madison, Madison, WI

9:35 – 11:20 **Workshop Session 1**

A. Developing assessment for student skills: A Resources for Excellence workshop

Heather Sklenicka, Rochester Community and Technical College, Rochester, MN

Olga Katkova, Western Nebraska Community College, Scottsbluff, NE

B. Greeks, geeks, and goofs: A collaborative catalyst for creativity in the classroom

Mindi Bailey, Regina Hughes, and Dawn Richardson, Collin College – PRC, Frisco, TX

11:20 – 11:35 **Refreshment Break and Exhibits**

11:35 – 12:55 **Workshop Session 2**

A. Climate change activities to enhance understanding

Jerry Bell, University of Wisconsin-Madison, Madison, WI

B. Undetermined (proposals invited)

11:35 – 12:20 **Parallel Presentation Session 8**

A. Two-year college chemistry: So far to have come, so far to go

Kenneth Chapman, The Carmel School, Ruther Glen, VA

B. The stigma and reality of a community college education: A student's perspective

Austin Tomanek, University of North Texas, Denton, TX

12:20 – 1:05 **Parallel Presentation Session 9**

A. Moving spectroscopy earlier in the organic I semester: A discussion

C. Frederick Jury, Collin College – SCC, Plano, TX

B. Using the ACS Assessment Tool for Chemistry in Two-Year College Programs: A panel discussion of first hand experiences

Heather Sklenicka, Rochester Community and Technical College, Rochester, MN

1:05 – 2:00 **Lunch Break and Exhibits**

2:00 – 3:00 **Closing Presentation**

Using secrets of playwriting to teach chemistry in and out of the classroom

Holly W. Kerby, Madison Area Technical College, Madison, WI

3:00 – 3:15 **Closing Remarks**

Presenting at the Conference

If you wish to present or conduct a workshop at the conference, there still is room. Please send your title and abstract to ael-ashmawy@collin.edu by January 15, 2014.

Registration

Registration can be completed by going directly to <http://www.2yc3.org/registration204.htm> or by going to <http://www.2yc3.org> and clicking on the Meetings tab.

Lodging

Blocks of rooms have been reserved at both Holiday Inn & Suites and Comfort Suites. A 2YC3 group rate is listed with each hotel below. This rate includes a hot breakfast. You must reserve with a credit card by February 28, 2014 to receive the group rate. Rate subject to change based on availability beyond that date.

Holiday Inn & Suites (closer to banquet, shopping)

\$79/night + taxes (King and Double Queen)

\$89/night + taxes (Double Queen Suite)

Allen North Event Center

205 Central Expressway North

Allen, TX 75013

(972) 727-2000

9.6 miles from campus

Comfort Suites (closer to campus)

\$85/night plus taxes

Location TX505

1590 N Central Expressway, McKinney, TX

(972) 548-9595

1.4 miles from campus

You Can Be a Part of 2YC₃ An Invitation for Submissions to the Chemistry Outlook

From the Editor: I would like to invite any and all members of 2YC₃ to consider submitting interesting and relevant articles, commentary, announcements, job postings or photographs for inclusion into the Chemistry Outlook. *Do you have an interesting and relevant story to tell about your past 2YC₃ experiences? Do you have an interesting classroom activity you'd like to share? How about a demonstration or a teaching technique that you think works especially well? In the past we have published conference commentary, "It Works for Me", photographs of students excelling at presentations and workshop announcements.*

I would ask that submissions be fairly short so that we can include more in the newsletter. Submissions may be published on an editorial appropriateness and space-available basis, and should be typed in Times New Roman font, single-spaced, 12-pt. I look forward to hearing from you!

Deadlines for submissions for 2014:

Issue II (due out mid-April 2014): March 15, 2014

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**205th 2YC₃ Conference
Conference Announcement
Call for Papers**

***Active Learning:
Engaging Students in the Classroom and Laboratory***

**May 16-17, 2014
University of Wisconsin-Fox Valley
1478 Midway Road, Menasha, WI 54952**

We are currently looking for colleagues who would like to contribute to our program by giving a presentation, leading a workshop, or participating in panel discussions. We especially encourage topics related to our theme “Active Learning: Engaging Students in the Classroom and Laboratory.” If you would like to present on a different topic, please do not hesitate to submit an abstract, as we encourage as diverse a program as possible.

Please note: The latest conference updates will be available on the University of Wisconsin Colleges Chemistry Department website as they become available (<http://uwc.edu/depts/chemistry>).

Contact Program Chair:

Kristin Plessel kristin.plessel@uwc.edu

**Important Announcement from 2YC₃ COCTYC
Repurposement of Regional Advisory Boards (RABs)**

**What were once RABs
Are now TABs**

The executive committee governing the 2YC₃, Committee on Chemistry in the Two-Year Colleges (COCTYC), has decided to repurpose the Regional Advisory Boards (RABs). The regional model predated today's communication networks and abilities. Much of the discussion by COCTYC has centered on organizing volunteers by task, rather than region to better serve the evolving needs of our membership.

Effective January, 2014, the Regional Advisory Boards will no longer exist. The COCTYC is presently in the process of creating and defining specific Task Advisory Boards (TABs) that will accommodate the current goals of 2YC₃. Please look for specific updates on the TAB groups in upcoming newsletters and on the website.



23rd BCCE
at
Grand Valley State University

Greener on the Grand:
Empowering Chemical Educators for a Greener Tomorrow

<http://www.bcce2014.org/>

2YC₃ co-chairs
Bal Barot
Tom Neils
Michele Turner

The Biennial Conference on Chemical Education (BCCE) is a national meeting sponsored by the Division of Chemical Education (DivCHED) of the American Chemical Society (ACS). It is designed for those who teach chemistry at all levels: secondary school science teachers, undergraduate and graduate students, and post-secondary chemistry faculty. The Conference provides anyone teaching chemistry opportunities for interacting with like-minded colleagues in both formal and informal settings. Teachers who are about to launch their careers, those who are new to teaching chemistry, and those who have teaching experience will find this conference to be an excellent source of materials, techniques, and chemistry content. The BCCE helps teachers make connections with others equally committed to teaching chemistry. The Department of Chemistry at Grand Valley State is proud to host the 23rd BCCE, ***Greener on the Grand: Empowering Chemical Educators for a Greener Tomorrow***, from August 3 – 7, 2014. Sherril Soman is the general chair of the conference.

Visit and bookmark the 23rd BCCE website for specific information about the conference. This site will be continuously updated with information pertaining to the technical program, registration, housing, and social events as we approach August, 2014. Any questions, program ideas, or general suggestions for any of the BCCE program chairs can be sent to the BCCE email address, bcce2014@gvsu.edu.

Two-year college faculty and students among 2013 ACS honorees

Compiled by Blake Aronson, ACS Office of Two-Year Colleges

ACS Fellows

Two two-year college representatives were among the 2013 class of ACS Fellows. The following were among 213 ACS members honored for their contributions to science, their profession, and the Society:

- o Amina Khalifa El-Ashmawy, Collin College
- o Harry Hajian, Community College of Rhode Island (Emeritus)

All ACS Fellows must demonstrate both excellence in their profession (such as excellence in chemistry research, teaching, or managerial leadership) and outstanding service to ACS (such as governance service, publications, or symposium or outreach organization.)

Nominations for the next class of ACS Fellows will be accepted February 1 through April 1, 2014. To learn more about the ACS Fellows program, please visit www.acs.org/fellows.

ACS Student Chapter Awards

The Society Committee on Education (SOCED) selects student chapters to receive special recognition on the basis of their programs and activities, as described in their chapter reports. The ACS student chapters at the following two-year colleges were honored in 2013.

- **Outstanding Chapter Award**
 - o City Colleges of Chicago Wilbur Wright
 - o East Los Angeles College
 - o Salt Lake Community College
 - o South Texas College
 - o Texarkana College
 - o Texas Christian University
- **Commendable Chapter Award**
 - o Anne Arundel Community College
 - o Bellevue College
 - o Chabot College
 - o Georgia Gwinnett College
 - o Pasadena City College
 - o Spring Hill College
- **Honorable Mention Chapter Award**
 - o Allegheny College
 - o College of the Canyons
 - o El Camino College
 - o Illinois Valley Community College
 - o Los Angeles City College
 - o Midland College
 - o Monroe Community College
 - o Saint Louis Community College at Florissant Valley
 - o Southwestern College
- **Green Student Chapters Award**
 - o Bellevue College
 - o College of the Canyons
 - o East Los Angeles College
 - o Los Angeles City College
 - o Salt Lake Community College
 - o South Texas College
 - o Texarkana College

ACS student chapters are evaluated by a peer review committee after they submit their annual reports. The next review will be Summer 2014. For more information, please visit www.acs.org/StudentChapters.



High-Altitude Ballooning Summer Programs at the City Colleges of Chicago

By Bernhard Beck-Winchatz, Ph.D.

STEM Studies Department

DePaul University, 990 W Fullerton Ave., Suite 4400, Chicago, IL 60614

Engaging students in meaningful research experiences beyond standard laboratory experiments teaches them how to solve complex real-world problems, piques their interest in science, and can motivate them to pursue careers in STEM disciplines (Olson & Labov, 2012; Berrett, 2012; Cejda & Hensel, 2009). Students who participate in undergraduate research, in particular those from underrepresented demographic groups, are also less likely to drop out of science fields (Vieyra, Gilmore, & Timmerman, 2011). In spite of these benefits, it is often difficult for 2-year college faculty to involve large numbers of their students in research because of high teaching loads, limited facilities and lack of financial support (Kincaid et al., 2007).

High-altitude ballooning (HAB) is an exciting and cost-effective way to get undergraduates involved in research. Balloon-based experiments help students develop research skills by replacing instructor-driven standard lab exercises with open-ended student-centered research. Students love HAB because it allows them do research in an extreme near-space environment that is unlike anything found on the surface of Earth, and because it allows them to plan and execute balloon flights that are reminiscent of NASA space missions.

The balloon platform is extremely versatile and works in many different educational contexts. Our students have conducted research in chemistry, physics and geophysics, astronomy, microbiology and environmental science. We have used HAB as part of courses for science and non-science majors, in multi-week undergraduate summer research programs, in independent research projects, in extracurricular science clubs activities, and for outreach to high schools and middle schools. Getting started is easier than you might think. In our experience, instructors without prior knowledge are able to execute flights independently after participating in just one or two training launches.

In summer 2013 ten faculty members and 14 of their students from the City Colleges of Chicago and from DePaul University teamed up to train faculty in HAB and to support a six-week undergraduate HAB research program. In the first part of a faculty workshop held on July 12, the participants learned how to design balloon experiments that expose different substances, microorganisms, and instruments to the extreme cold, low , and intense radiation of near space. These experiments often require temperature, pressure, radiation, light and other sensors connected to data loggers to record measurements during the flight (figs. 5 and 6). Depending on student background and instructional goals, instructors can choose from a variety of options, ranging from simple plug-and-play systems, such as Vernier and Pasco probeware, to microcontroller-based systems that require basic electronics and programming knowledge. Another common payload component are modified point-and-shoot cameras, which can be used to monitor experiments during the flight, and to take pictures of the ground, the atmosphere and the balloon expansion. To modify the cameras students can either build simple trigger circuits and solder them to the shutter button (Cheng & Rahimzadeh 2005), or they can write short scripts in the BASIC programming language using the Canon Hackers Development Kit (chdk.wikia.com). An easy-to-use alternative to modified point-and-shoot cameras are action camcorders, such as the ones made by GoPro and Contour, which do not require any modifications. Because balloons travel through commercial airspace, payloads have to comply with Federal Aviation Administration regulations. These regulations are easy to follow, and include, for example, a 12-lb limit for the total payload weight and a maximum breaking strength of 50 lbs. for the payload suspension line (U.S. GPO 2013).

In the second part of the workshop the faculty learned how to plan and execute balloon flights. To generate the necessary lift balloons are filled with helium or hydrogen. Near Space Ventures (nearspaceventures.com) provides a web-based tool to calculate the lift required for a given payload weight. For example, if a payload weighs 10 lbs., 14 pounds of lift are required to achieve an ascent rate of 1000 feet per minute with a 1500 g balloon. At this rate the balloon will ascend for 1.5-2 hours, burst at an altitude of approximately 28 km, and (depending on parachute size) descend back to the ground in about 30 minutes. Too much lift will result in short flight times because the balloon will ascent and burst too quickly. Too little lift increases the flight time and may lead to excessively long flight tracks. Near Space Ventures's flight prediction tool uses wind speed data provided by the National Oceanic and Atmospheric Administration to predict the path of the balloon

based on launch date and time, location, ascent rate and expected burst altitude. Once a prediction for the flight path has been made, a launch site can be selected that minimizes the risk of landing in an area where payload recovery would be difficult, such as a forest or a lake. Workshop materials are available for download at goo.gl/AEYN9m.

After completing the workshop, the City College faculty conducted two training flights on August 16, 2013 and on September 13, 2013. The first flight focused on giving faculty hands-on experience with the basic flight procedures. They learned how to set up the GPS tracking equipment in the chase vehicles, how to fill and launch the balloon, and how to track, chase and recover it after landing. The second flight focused on working with students on payload construction and flight operations. After two successful flights faculty and students were excited about the prospect of starting an HAB program at the City Colleges. Data, pictures and video clips from the second flight can be downloaded at goo.gl/P8IgHt.

The second component of the joint HAB program was an undergraduate summer research opportunity, which was part of the Chicago Initiative for Research and Recruitment in Undergraduate Science (cirrus.depaul.edu) and took place from June 24-August 2, 2013. The research team consisted of seven City College and DePaul students and was lead by a DePaul faculty member without prior HAB experience. The purpose of the student research was to study sources and sinks of carbon dioxide by measuring variations of CO₂ concentrations at different altitudes in Earth's atmosphere over time and at different locations (fig. 7). The program demonstrated that faculty can develop the necessary skills to engage their students in meaningful balloon-based research in a relatively short amount of time. After being coached by two experienced colleagues during their first two flights, the students and their faculty mentor were able to successfully carry out the next four flights without any outside help. The team presented the results of their summer research at the CIRRUS symposium on August 2, 2013. A student-produced video of one of their flights can be viewed at youtu.be/aQ4P0RZGed8.

STARTING YOUR OWN PROGRAM

If you are interested in getting your own students involved in balloon-based research, a good place to start is the Space Grant Consortium of your state (spacegrant.org/about/who), which can help you find existing college or university-based balloon programs in your region. Many programs will allow you to participate in their launches and fly experiments, so that you can gain some experience without having to purchase your own equipment right away. Another option is to contact StratoStar (stratostar.net), a small Indiana-based company that specializes in educational high-altitude ballooning equipment and also provides training. The recently founded Stratospheric Ballooning Association (SBA) is an organization that promotes STEM learning and research through HAB at colleges and universities. Contact Don Takehara (dmtakehara@sbcglobal.net) to find out how SBA can help you start your own program.

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FIGURES



Fig 1: Just before a double-launch. Credit: Mark Potosnak (left),
Fig 2: View of the horizon and Earth's atmosphere from an altitude of 28 km (right).



Fig 3: Balloon burst at 28 km. captured by a camcorder attached to the payload.



Fig 4: Flight path of the two balloons launched on August 16. Also shown is the route taken by the chase vehicle.

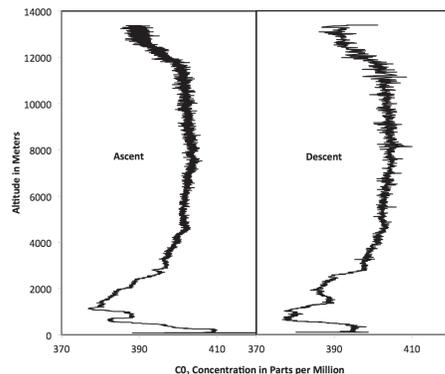
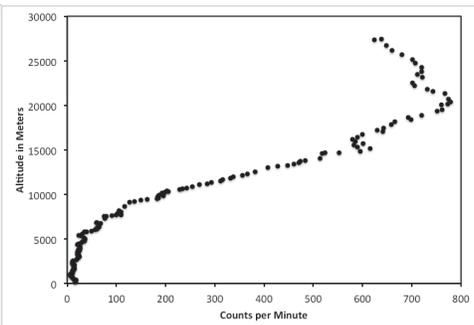
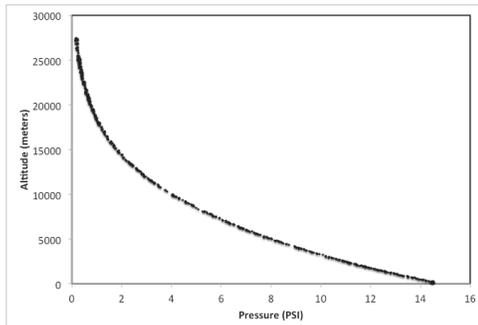


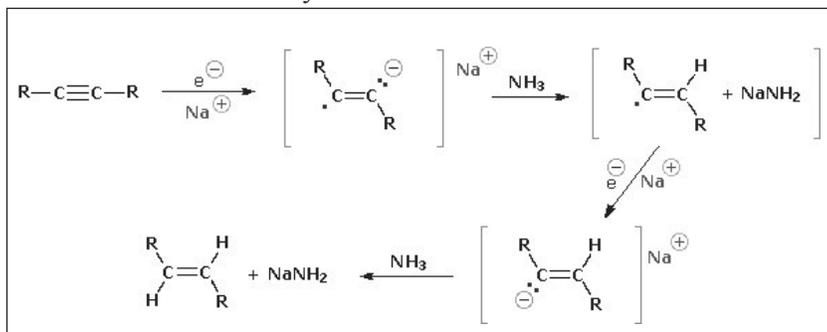
Fig 5: Atmospheric pressure measured during the flight on September 13 (left),
 Fig 6: Cosmic ray counts measured during the flight on September 13. (middle)
 Fig 7: CO₂ concentrations measured during a balloon flight. Credit: Monica Pocs (right).

Teaching Organic Chemistry by Story Telling

Bal Barot, Lake Michigan College, Benton Harbor, MI 49022

Over the years of teaching organic chemistry, I have told stories to transmit knowledge. It provides fun to me. There are number of folk tales which have potential connection to teaching chemical concepts. Let us consider just one here. Study the mechanism shown here.

Table 1: Reduction of alkynes



Compare this reaction mechanism to the following famous story in Table 2.

Table 2: Teaching reduction of alkynes with storytelling strategy:

There's an old Chinese legend about a man whose horse broke out of the corral and ran away. His neighbors sympathized, "Sorry to hear about your horse—too bad." (Negative: Addition of negative electron by sodium in the first step!) The next day the horse returned and led five beautiful wild stallions into the fold. "Good news about your horse returning," the neighbors said. (Positive: Ammonia provides positive proton in the second step!) "Well, we don't know if it's good news or not," said the man. The next week his son was thrown off one of the wild stallions and the boy broke his leg. "So sorry about your son," said the neighbors. "Too bad he broke his leg." (Negative: Addition of second electron to free radical intermediate!) "Well, we are not sure it's all bad," responded the man. The next day a military leader came by conscripting all able-bodied young men for the military. The man's son was exempted because of his disability and all the neighbors rejoiced, "Good news is that your son does not have to go off to war," they said. (Positive: Ammonia provides second positive proton in the last step!)

The point is to understand the mechanism of organic reaction, show the analogy and aid students' memory. Story telling can be used effectively to make organic chemistry fun and exciting. There are many pedagogical approaches to teach organic chemistry, but their effectiveness may vary depending on local situations and degree of implementation of these diverse pedagogical approaches and teaching strategies.

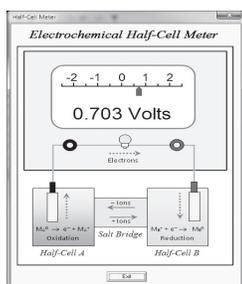
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