College Chemistry Canada
La Chimie Collégiale au Canada

Newsletter

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45TH COLLEGE CHEMISTRY CANADA (C3) CONFERENCE, MAY 24-26, 2018

You are cordially invited to attend the 45th College Chemistry Canada Conference, May 24 - May 27, 2018, at NAIT in Edmonton, AB. The theme for the 2018 C3 Conference is "Chemistry: From Classroom to Career".

Registration options include full conference or one-day registration. Click here for online registration. Early registration rates apply until March 31, 2018.

Presentations are invited from everyone in the teaching community, on topics such as active teaching strategies in the classroom and laboratory, industry driven education, public outreach initiatives, and industry and college collaboration.

Deadline for abstract submission is April 30, 2018. Click here for abstract submission.

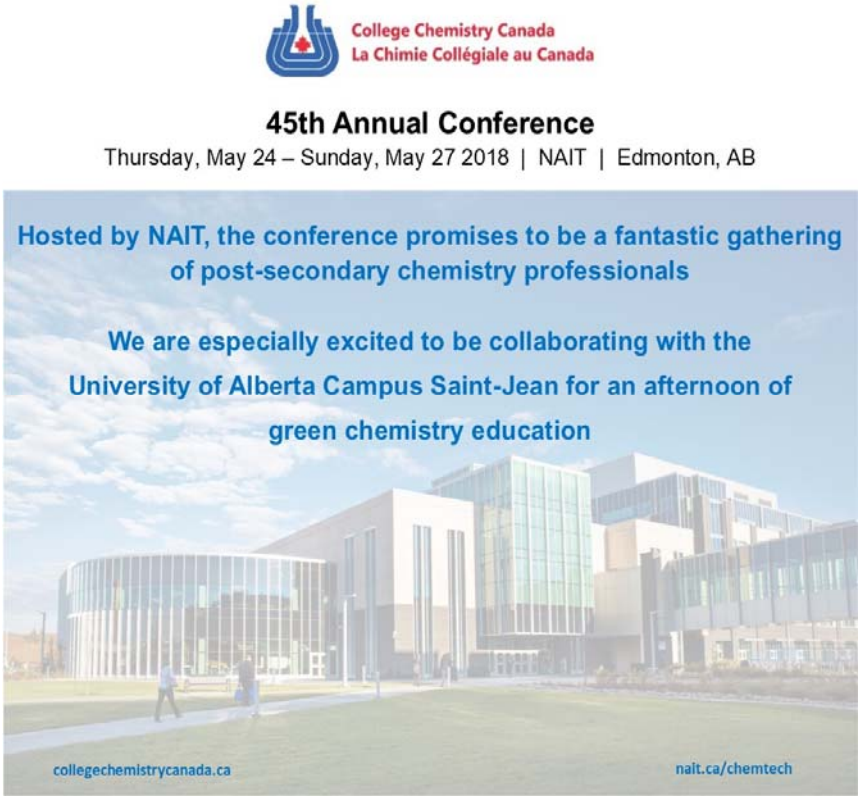
Visit the conference website for information about the conference program, optional activities, accommodation, and conference sponsorship.

Please feel free to contact us with any questions that you may have.

We look forward to seeing you at NAIT in May!

Paula Hawrysz & Laura Lucan,

Conference Coordinators
45th College Chemistry Canada Conference at NAIT in Edmonton, May 25-27, 2018



http://collegechemistry.ca/conferences/18conf/conf2018.html

COLLEGE CHEMISTRY CANADA 2018 CONFERENCE PLENARY SPEAKERS

Charles Lucy, University of Alberta

Bio: Dr. Charles (Chuck) Lucy is a Professor Emeritus at the University of Alberta. Chuck is a passionate teacher who has taught classes of 400+ freshman students to small discovery based graduate lectures, but his primary teaching has been introductory analytical chemistry. He is a contributing author to Daniel Harris's Quantitative Chemical Analysis, the most popular textbook in the field. Chuck has organized many W.E. Harris Teaching Workshops that brought instructors from across western Canada together to discuss the teaching of chemistry, and many chemistry education symposia at national meetings, Pittcon and Pacifichem. Chuck has received the Faculty of Science Teaching Innovation Award and the Rutherford Award for Excellence in Undergraduate Teaching from the University of Alberta; and the Award for Chemistry Education from the Chemical Institute of Canada; and has been named a 3M National Teaching Fellow and inducted into the WACE Co-op Hall of Fame.

COLLEGE CHEMISTRY CANADA 2018 CONFERENCE PLENARY SPEAKERS—continued

Charles Lucy, University of Alberta - continued

Chuck has supervised 35 graduate and 40 undergraduate research students, and co-authored 160 articles and 500 presentations on analytical chemistry and chemistry education.
Chuck's research recognitions include: the W.A.E. McBryde Medal and Maxxam Award from the Canadian Society of Chemistry; the International Ion Chromatography Achievement Award; and a Killam Annual Professorship.

Heather Kaminsky, Centre for Oil Sands Sustainability, NAIT

Bio: Heather graduated from University of Alberta where she completed a PhD and BSc Co-op in Materials Engineering. Heather's PhD thesis was on the Characterization of an Oil Sand Ore and Process streams, where she learned about the types of clay minerals found in the oil sands and studied how they distribute around extraction. During her thesis she also undertook work to study the fundamental structure of some of the clay and heavy minerals in the oil sands using advanced characterization techniques such as quantitative x-ray diffraction, and transmission electron microscopy. After graduation Heather worked for Total Canada for 5 years and for Suncor Energy for 2 years in research engineering roles. Heathers work in industry focused on: Advanced Ore Characterization, Impacts of Clay Minerals on Extraction and Tailings, Fundamentals of Tailings, Tailings Planning, Novel Tailings Treatments, Materials Wear and Corrosion, Water Treatment, Water Chemistry Modeling, Waste Valorization.
Heather was also heavily involved in both CONRAD and COSIA chairing the Clay Focus group for both organizations as well as the Deposit Characterization Working group for COSIA.
Heather currently works at NAIT's Center for Oil Sands Sustainability where she leads the Mining research team. Heather has a passion for Clays and Tailings and hopes to play a key role in solving tailings as an issue for the oil sands industry. This passion has earned her the moniker "Queen of Clay".

TEACHING AT A POLYTECHNIC – Showing how Chemistry can be the Central Science

By Jimmy Lowe (Jimmy_Lowe@bcit.ca), BCIT, BC

I have the opportunity to teach into a different number of diploma and degree programs at BCIT. We have often discussed how some students may feel that their Chemistry course is just a required course to get to graduation. In this article, I would like to share some of the labs, topics and videos that I have used as resources to connect Chemistry to the students' program.

Bachelor of Technology in Electronics. Students synthesize nickel nanowires from an electrolytic cell[1]. The green chemistry aspect has the reuse of the nickel sulfate solution since the concentration does not change in the electrochemical cell. The isolated nanowires are magnetic and orient in a magnetic field. When I first taught the lab, many students asked "what nickel on the nanoscale could be used for?". Flash forward to exploding batteries on cell phones and hover boards - researchers at Stanford use nano-nickel clusters to build a smarter battery[2]. The course topics has a section on graphene that was the material studied for the 2010 Nobel Prize in Physics[3].

Prosthetics and Orthotics Program. For this program, I teach a module on the structure-property relationships of polymers. Many topics and problem sets can be based on surfing the "Macrogalleria" which introduces polymer chemistry topics and applications[4]. Using 3D printing many prosthetics can be rapidly or custom produced[5]. Poly(lactic acid) [PLA] is a biodegradable polymer and is a popular filament material for 3D printers. Cleaned PLA products (eg clam shells, cups, cutlery) can be recycled into more filament[6]. Students also generate a large amount of prosthetics using PE, PP, and PS. I show a video where the plastics can be converted back to oil-based products using pyrolysis[7]. The city of Whitehorse (Yukon) adopted this technology in 2012 to reduce the costs of shipping plastics to Vancouver for recycling[8].

Jimmy Lowe ,
C3 President, BCIT, BC

"When I first taught the lab, many students asked "what nickel on the nanoscale could be used for? Flash forward to exploding batteries on cell phones …".

TEACHING AT A POLYTECHNIC - continued

Biotechnology BSc (Joint degree with UBC). A green chemistry lab has students synthesizing benzoin from benzaldehyde using thiamine hydrochloride (biological coenzyme – Vitamin B1) as the catalyst. This reac□on was accomplished using the cyanide anion and is introduced as a mechanistic queston so students can see a decrease in the danger level. In the first week of the lab, the reaction mixture takes approximately 25 minutes to make allowing the students to practice general sample preparation for NMR / FTIR (or any other assigned lab work). In the second week, benzoin can be recrystallized using ethanol as the solvent. There sufficient time for analysis by ^{1}H NMR (1 sample run for the whole group to minimize reagents used; students vote on who has the best crystals) and IR spectroscopy by KBr (option to run in groups as well). The Pavia et al. text outlines further steps to convert the benzoin into benzil and then rearranged into benzilic acid.[9]

I hope you will have a chance to use a video or incorporate one of these labs in one of your courses. Please contact me if you have any questions.

References

1.Bentley, A. K.; Farhoud, M.; Ellis, A. B.; Lisensky, G. C.; Nickel, A. L.; Crone, W. C. *J. Chem. Educ.* **2005**, 82, 765-768. Additional **video,** photos and alternate procedure found at https://education.mrsec.wisc.edu/synthesis-of-nickel-nanowires-beaker/ (accessed Feb. 20, 2018)

2."New Stanford Battery Shuts Down at High Temperature" –uses nano Ni clusters
https://www.eurekalert.org/pub_releases/2016-01/su-nsb010716.php (Accessed Feb. 28, 2018)

3.Find out about graphene with the Professor (Sir Martyn Poliakoff) http://www.periodicvideos.com/videos/mv_graphene.htm (Accessed Feb. 28, 2018)

4.The Macrogalleria – a Cyberwonderland of Fun! http://www.pslc.ws/macrog/index.htm (Accessed Mar.7, 2018)

5."How 3D Printed Hands are Changing Kids' Lives" National Geographic https://www.youtube.com/watch?v=Cl8ijPGEKO8 (Accessed Mar. 10, 2018)

6.PLA Products and Recycling http://www.plastics.gl/packaging/hot-stuff/ (Accessed Mar. 10, 2018)

7."Plastic to Oil Fantastic" Carol Smith, United Nations University. https://ourworld.unu.edu/en/plastic-to-oil-fantastic (Accessed Mar. 10, 2018)

8.The Plastic to Oil Machine. CBC News, http://www.cbc.ca/news/canada/north/whitehorse-gets-machine-to-convert-plastic-into-oil-1.1287529 (Accessed Mar. 10, 2018)

9.D. L. Pavia, G. M. Lampman, G. S. Kriz, R. G. Engel. Lab adopted from Introduction of Organic Laboratory Techniques – A Small Scale Approach, 2nd ed. 2003. Brooks / Cole Laboratory Series, pp. 307-315.

EMAIL-FEEDS FOR BUSY PROFS

By Carl Doige (cdoige@okanagan.bc.ca), Okanagan College, BC

Carl Doige,
C3 Newsletter Editor
Okanagan College, BC

During the semester, my life is a busy blur from lab prep to lecture prep to (what seems to be) endless grading to committee work. I am therefore very selective about what I permit to arrive into my email inbox and I am trigger-happy to delete unsolicited emails. I have, however, maintained a subscription to the **Chemistry World** daily newsletter. This free service sends me (as the name implies) daily email updates concerning advancements in chemistry including for instance the new IUPAC definition of the mole and an example of the longest carbon-carbon bond.
https://www.chemistryworld.com/

Another free subscription which arrives three times per week into my email box is the newsletter from Magna Publications website called **Faculty Focus**. This newsletter focuses on effective learning and teaching strategies in the college classroom. Given that most of the decisions I make on a day-to-day basis are on how to best support student learning (of chemistry), I usually find the articles to be timely, supportive, and helpful. As members of the C3 community also make learning and teaching a priority, I thought it may be beneficial to highlight this non-chemistry resource by providing access and summaries of some articles. If the reader finds these articles interesting, they may consider accessing the many archived articles on the Faculty Focus and/or subscribing to their email alert service.

Cell Phone Policies: A Review of Where Faculty Stand

This article summarizes the input from faculty readers concerning policies used to moderate cell phone use in the classroom. The policies were organized into broad categories (Prohibition, Limited Use, Student Decides, Novelity Incentives) and examples and comments are provided for each. An over-arching question of the article is "Are policies the best way to get students to stop using cell phones?" and a suggestion is made to appeal to students' understanding that multitasking does not work.
https://www.facultyfocus.com/articles/effective-classroom-management/cell-phone-policies-review-faculty-stand/

"Everybody with Me?" and Other Not-so-useful Questions
This article reminds us that vague questions like "Does this make sense?" or "Any Questions" often do not solicit useful information about student understanding, especially when students are prone to overrate their competence in the subject material. In the article, we are also reminded of the brief but generally very effective Classroom Assessment Techniques originally described by Angelo and Cross (cited in article). For example, we can prompt students to write in sentence about the muddiest point of the lesson.
https://www.facultyfocus.com/articles/teaching-and-learning/bad-questions-prompts/

A Memo to Students on Cheating
This article is written like a memo and the readers are encouraged to use it (or adapt it for use) with their own students. Rather than the heavy-handed message "Cheating is wrong and will be penalized", the memo appeals to students' higher sense of responsibility for developing the skills and knowledge related to the course. It reminds students that they can accomplish goals without cheating. It also encourages students to connect their actions to their sense of integrity and what kind of person they want to be. This message seems to be all the more poignant in our current climate of fake news.
https://www.facultyfocus.com/articles/teaching-professor-blog/memo-students-cheating/

Three Reasons to Ditch Technology in Your Flipped Classroom
As many of us engage in using technology such as videos, online quizzes and homework, and in-class clicker questions to support learning in a flipped or blended, environment, this article encourages us to consider the benefit of using low tech approaches and activities in the classroom. It reminds us that students can be overwhelmed by a flurry of powerpoint slides and videos. The articles offers some suggestions involving dice, sticky notes, and index cards which can easily be adapted to a chemistry classroom.
https://www.facultyfocus.com/articles/blended-flipped-learning/three-reasons-ditch-technology-flipped-classroom/

CHEMISTRY IN MUSIC REVIEW

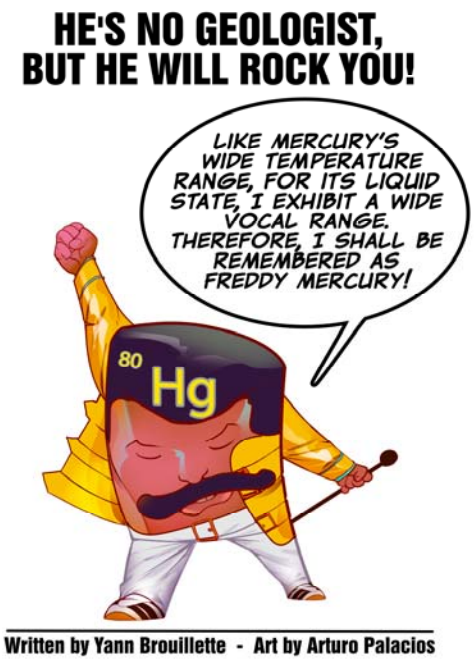
Jessie Key, C3 Regional Director (BC and Yukon), Vancouver Island University, BC

By Jessie Key (Jessie.Key@viu.ca), Vancouver Island University, Nanaimo Campus, BC

Chemistry and music go together like macaroni and cheese. In fact, I am often told by my students that they are 'tuning me out', which I can only assume to be some millennial term which means 'thinking of a song that they enjoy, while actively listening to my lecture.' It is no surprise that many popular songs in various musical genres are inspired by, describe, or are named after, chemical principles. Herein, I will review a few of these songs for both their musicality and scientific accuracy:

- "Chemistry" by Arcade Fire: a jaunty tune from a Canadian indie rock group. The use of brass instruments is a bold but quirky choice. Unfortunately the lyrics of this song are very limited, mostly repeating the line "You and me, we've got chemistry." This statement is scientifically accurate in that all humans are organisms made of matter, primarily in the form of the major biomolecules such as proteins, lipids, carbohydrates, and nucleic acids.

- "Slow Chemical" by Finger Eleven: a haunting and dark rock song from the Canadian band out of Burlington, Ontario. The slow but heavy guitar riffs lend the song a feeling of longing. Sadly, the lyrics of this song are not very scientifically accurate. The main chorus repeats "You could be the chemical," which shows a lack of understanding of terminology. Humans cannot be a single chemical, rather they are composed of many chemicals. Another statement "when everybody wants you, the chemical goes slow," incorrectly correlates speed with desire. I suggest the band alters this to a more accurate, but still catchy "when temperature gets cold, the molecule goes slow."



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THE PRESIDENT'S MESSAGE

Jimmy Lowe, C3 President

Greetings fellow C3 members,

Time is rolling by quickly as we approach the 45th annual C3 conference hosted by NAIT, in Edmonton, Alberta, May 24th-27th , 2018. This will mark the third time that NAIT has hosted the annual conference (1986 & 2008). Registration and abstract submission are now open for what promises to be a great opportunity to network, 'talk shop' and get engaged.

Accompanying the flow of time is change. In BC, there will be a change in the K-12 curriculum. This updated education model will focus on mastering competencies without letter grades. There will be opportunities for students to choose their learning activities and self-evaluations. The updated grade 10-12 science curriculum will be introduced over the next two years. In particular, there may be changes to the core content in Chemistry 11 and 12 based on the draft curriculum. BC post-secondary institutes will need to discuss (i) how to assess the knowledge and skills of the graduating class of 2020, (ii) design and forms of assessment in the post-secondary classroom, (iii) the role of industry and certification by testing. I think this could definitely end up being a future C3 talk / poster.

On beahalf of C3, I would like to acknowledge and thank two of our past executive: James Bailey (UBC-Okanagan) who was the C3 webmaster for 7 years and retiring in the near future; Mary Sheppard (St. Mary's University) who is back at school for a PhD in Chemical Education. In succession, John Lee (Camosun College) and Carl Doige (Okanagan College) have seamlessly jumped into those positions. We are always looking for article submissions for the newsletter.

This leads into the call for any interested members to step into the executive and regional director roles (or shadow a position – e.g. the President-elect). Just send us an email. Have a fantastic end to the academic term. I hope you and your colleagues will be able to join us in Edmonton!

Warm regards, Jimmy

PS Save the date for C3 Conference in Victoria, BC, 2018. More details coming!

Reference

Updates can be found at https://www2.gov.bc.ca/gov/content/education-training/k-12/teach/curriculum

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