

C₃News

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Newsletter of  College Chemistry Canada / La Chimie Collégiale au Canada

Chemistry and Open Learning Featured at 1990 Conference

By Alan Davis

A varied and interesting program is starting to emerge for the 1990 C₃/2YC₃ Joint Conference to be held at Capilano College. A new topic for most of us, "Chemistry and Open Learning", will open the conference on June 15, featuring speakers from the Open University, Athabasca University, North Island College, and the Thames Polytechnic, London England.

The afternoon session on the 15th deals with Biological Chemistry with a plenary by Dr. David Dolphin (U.B.C.) and presenters from Western Washington University and the Thames Polytechnic.

A general session occupies Saturday morning followed by a safety workshop presented by Dr. Keith Berry of the University of Puget Sound.

Other plenary sessions include Pat Davis of the Seattle Ports Commission on the importance of the Pacific Rim to the future of North American trade and culture (including chemistry), and Particle Physics for the Uninformed, by Professor Lowell Brown (University of Washington).

Join us for this program and the many opportunities to socialize and meet exhibitors next June!

Contact Penny Le Couteur at Capilano College (604) 986-1911, or Alan Davis at the B.C. Open University (604) 660-5256 to get on the mailing list. □

Professional Development at B.C. Universities

By Bob Browne
Douglas College

Have you ever thought of returning to university to do some research or tackle a professional development project? Most university chemistry departments are happy to have visiting community college instructors, whether for a couple of months in the summer, or a year's educational leave. Many faculty contracts provide for periodic leaves for instructors to return to industry or university for upgrading. The universities I contacted, however, indicated that few college instructors take advantage of this opportunity. For this reason, some have created fellowships and are actively recruiting people to apply for them. I surveyed the three universities in British Columbia to see what programmes each has set up to provide these professional development opportunities.

In 1989, Simon Fraser University started its Community College Fellowship Programme. The purpose of these fellowships is to provide an opportunity for science faculty from B.C. community colleges to carry out research in collaboration with a

faculty member, or to work on the development of teaching materials. Four of these are awarded annually, one each in Biosciences, Chemistry, Physics, and Mathematics/Statistics. The duration of these fellowships is ten weeks during the summer (May through August) and during this period, Fellows are appointed as Adjunct Professors at the University. For Fellows from outside the Lower Mainland, a relocation allowance of up to \$2500 is available, and the University will also make available a grant of up to \$1000 to cover materials and supplies used in research or teaching development projects. The first Fellow in chemistry was Alan Gilchrist from Capilano College who undertook a project called "Chemistry in a Canadian Context". An example of some of Alan's work appears elsewhere in this newsletter. Inquiries regarding the SFU Community College Fellowship Programme should be directed to C.H.W. Jones, Dean, Faculty of Science, Simon Fraser University, Burnaby, B.C. B5A 1S6.

Please see P.D. Opportunities, page 3

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Reports from the Regions

Ontario Region

Strike at Ontario Community Colleges

By Dick Kroeger, Regional Director

On October 18th, 1989, the 8000 or so faculty in the Ontario Community Colleges went on strike. There were three main issues in the strike: job security, wages, and an accumulated sick leave plan. The fundamental cause for the work stoppage has arisen from the persistent underfunding of the college system by the Ontario government. As a result, the salaries of the faculty have fallen behind those of the elementary and secondary school teachers in Ontario.

The union and management positions on sick leave plans were also in dispute. The union demanded that the present sick leave plan be retained. In this plan, a full time faculty member can accumulate up to 20 days per year, and on retiring, receive payment for half of the accumulated sick leave up to a maximum of a half year salary. Management insisted on a new sick leave plan in which present employees would remain in the present plan whereas new employees would not. The union maintained that this would ultimately lead to the loss of benefits of the existing sick leave plan.

Walking the picket line in a strike can be a cold and frustrating experience. The frustration comes from being able to do so little in controlling the unfolding of events. As we walked back and forth in front of the college entrance, we seemed to contribute little or nothing to the ultimate settlement of the dispute. Other people far removed from the scene, union and management, were in apparent control of our financial destiny and prevented us from carrying on with our usual professional activities. The boredom of walking back and forth over the cement sidewalk and the chilling wind and rain only added to the discomforts of the situation. The realization that only the students and the faculty were suffering from the strike, whereas the government and management could sit back in their cushy chairs and count

the dollars saved by not paying the substandard wages of the faculty, was the biggest frustration of all.

I also observed that a strike of this type can bring out the caring side of people. The support staff at the Rideau campus of Algonquin College, on more than one occasion came out at noon to appease our walk-induced appetites with barbecued hamburgers and hot dogs. Such events were much appreciated during the dreary sidewalk routine.

Did the strike settle any issues? Even after four weeks of the strike, this is hard to evaluate since the dispute has now gone back to mediation with a new mediator. The community college teachers are now back in the classroom with the agreement that if the mediation does not produce a settlement then the mediator becomes an arbitrator and imposes a binding settlement. So the question remains, why did we not go by this route from the beginning? □


B.C. Region

Faculty Strike at Douglas College

By Bob Browne

The 406 members of the Douglas College faculty spent the greater part of the month of November (6th to 30th) walking the picket line in support of their negotiating team. In the 20 year history of the College, this was the first time the faculty had taken such action, and the strike was the longest ever in the college system in B.C. The major issues were salary (salaries were considerably behind the teachers in the school district), job security for contract instructors, and workload. Faculty support was strong, reflecting not only concern for the contract issues, but also the level of frustration which members feel for the way the College is being administered.

The month of November is among the wetter months in an already wet climate, but Douglas faculty felt that the settlement achieved was worth all of the wet feet. Substantial gains were made in the areas of



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Articles of any length will be gladly accepted. Please send typewritten copy to the Editor at the above address or send by fax. Copy can also be sent on a 5 1/4" floppy disk, IBM format, using WordPerfect, WordStar, Microsoft Word or any wordprocessor producing ASCII output. Deadline for the next issue is February 23, 1990..

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salary, job security, and in contract language. One of the interesting side-effects was the number of faculty members who met each other for the first time while on picket duty. Faculty came away from the strike feeling less isolated, and with a new resolve to work toward improving working conditions at the College. The semester was salvaged for the students by cutting the final exam period in both fall and spring semesters and running the fall semester into January.

On a happier note, we are glad to report that Bob Perkins, former editor of *C3 News* and winner of this year's Polysar Award, has accepted a full-time appointment at Kwantlen College. □

Chemistry in a Canadian Context

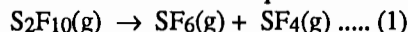
By Alan Gilchrist
Capilano College

This past summer, my professional development time was spent working under the direction of Dr. John Walkley of the S.F.U. Chemistry Department on a project aimed at ascertaining the merit of including "Canadian Content"(1) in the teaching of first-year level chemistry. The initial idea was to extract from the literature, both historical and recent material which might provide good, interesting and stimulating chemistry problems. It soon became apparent that there is a significant amount of "Canadian content" material which could be very effectively utilised, not only as a source of problems, but also as support material in lectures and tutorials. For example, there is Benson's paper from the University of Toronto describing the first example of a reaction whose rate decreases as the temperature is increased(2); attempts by King, of Dalhousie University, to separate isotopes by chemical means (unsuccessfully)(3); a discussion of "Ionization Potential and the Size of the Atom" by Eve, of McGill University(4).

Of the problems so far culled from the early research literature, two are presented here, one on kinetics(5), and one on solubility equilibria(6).

Kinetics #1

Trost and McIntosh, Can. J. Chem. 29, 508 (1952) in a study of the thermal decomposition of disulphur decafluoride showed that the reaction proceeds according to the equation



They found this to be a first order reaction, and by determining the pressure readings corresponding to equation (1) they ascertained the time for half of the S_2F_{10} to decompose.

Given the dependence of half-life with temperature as tabulated below, calculate

- the rate constant at each temperature, and
- the activation energy (kJ/mol) for the decomposition of S_2F_{10} to SF_6 and SF_4

$t_{1/2}$ (min)	Temperature (K)
218	434.0
63.6	444.0
17.3	454.0

Solution

- Use $k = \ln 2/t_{1/2}$

Temperature (K)	k (min^{-1})
434.0	0.00318
444.0	0.0109
454.5	0.0400

- Use $\ln(k_1/k_2) = (1/T_2 - 1/T_1) E_a/R$
 $E_a = 206 \text{ kJ/mol}$

Solubility Equilibria #1

In a study related to the quantitative separation of platinum and iridium in an alloy of these metals, E.H. Archibald and J.W. Kern of U.B.C. investigated the solubilities of the chloroplatinate, $(\text{NH}_4)_2\text{PtCl}_6$, and the chloroiridate, $(\text{NH}_4)_2\text{IrCl}_6$, of ammonia in ammonium chloride solution

Continued on page 4

P.D. Opportunities *continued* from page 1

A number of years ago, the Chemistry Department of the University of B.C. started its Science Master Fellowship Programme. Originally designed to foster closer ties between the Department and B.C. Secondary School teachers, it was later expanded to include the B.C. Community Colleges. The Fellowship provides the recipient with the opportunity to spend a year in the Department of Chemistry, as a full faculty member, to undertake a project in research or chemical education, or pursue studies in contemporary chemistry. Fellows are required to spend some 12 hours per week during the school term teaching in the Department's First Year Students' Resource Centre. The Fellowship provides a stipend of \$10,000 for the complete winter session (Sept. - April). Enquiries should be addressed to Professor L.S. Weiler, Head, Department of Chemistry, The University of British Columbia, 2036 Main Mall, Vancouver, B.C. V6T 1Y6.

The University of Victoria has no formal programme for encouraging College chemistry instructors to attend the University for professional development. The Department would, however, be glad to deal with applicants on an individual basis.

If you are thinking of spending some time in a university chemistry lab, it might be worthwhile contacting the university near you to see if a programme such as those in B.C. exists. Don't be discouraged if there isn't; you'll just have to approach individual faculty members in the chemistry department for space or money to pursue your project. Although many of us chose a career in teaching rather than in research, the benefits of taking time away from the classroom and returning to our academic roots can be very rewarding. □

Sorry...

As a result of the strike at Douglas College, this issue of *C3 News* has been mailed out one month late. We are still trying to keep the March 1 deadline for the next issue, which will contain Conference Registration information. Please send me any submissions as soon as possible.

Bob Browne, Editor

Hot From the Presses!

By Bob Perkins

H. Wickramasinghe reviews the latest developments in scanned-probe microscopes (Scientific American, p98-105 October 1989) while the rarest type of radioactive decay (double-beta decay) is described in a paper by M. Moe and S. Rosen (Scientific American, p48-55 November 1989).

"What is it that changes an undergraduate being taught into a postgraduate who is teaching" is the question posed by J. Olleton (New Scientist 1685, p69 October 7 1989)

concerning the use of undergraduate teaching assistants.

Bicyclic compounds containing sulfur atoms recently isolated from onions have been shown to relieve asthma in laboratory animals and humans (H. Wagner et al J. Amer. Chem. Soc. 111, p3805 1989).

The latest value for the half-life of a free neutron is 615 s (± 2 s) (W. Mampe, Physical Review Letters 63, p593 1989)

Guam disease (resembling Parkinson's and Alzheimer's diseases) has been recently associated with a rare amino acid found in the nuts of the false sago palm (*Cyas circinalis*). L-alpha-amino-beta-methylaminopropionic acid, when fed to monkeys, led to the degeneration of the central nervous system (New Scientist 1685, p31 October 7, 1989).

John Gribbon presents the world of quantum mechanics as a mystery to puzzle over, an excellent background article for students. (New Scientist 1682, p1-4 (Inside Science) September 16, 1989).

K. Laidler continues his wonderful series on the history of chemistry with The Story of the Gas Laws (Chem 13 News 187, p7-9 September 1989) and The Story of Electrolysis (Chem 13 News 189, p7-10 November 1989).

The September 1989 issue of the Journal of Chemical Education contains several useful articles:

R. King and K. Williams (pA213-A219) review FT-NMR.

L. Bretherick (pA220-A224) discusses the safety concerns of dealing with high oxidation state nitrogen compounds.

L. Nicholson (p725-726) describes an interesting kinetics experiment in which the fading of the colour of phenolphthalein in strongly basic solutions is found to be pseudo first order.

V. Ringnes (p731-737) traces the origin of the names of the chemical elements. □

Chemistry In a Canadian Context *continued from page 3*

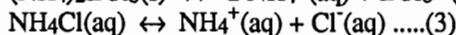
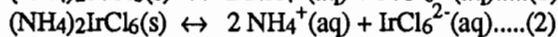
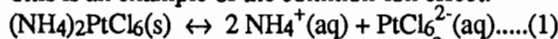
Their results, as reported in Trans. R.S.C., Section 3, p7-16 (1917), are given in the table below.

Concentration of NH ₄ Cl (mole/L)	Grams of (NH ₄) ₂ PtCl ₆ in 100 g of solvent	Grams of (NH ₄) ₂ IrCl ₆ in 100 g of solvent
2.000	0.0024	0.0027
1.000	0.0028	0.0640
0.2000	0.0186	0.0780
0.1000	0.0423	0.1793

Explain the observed trends in the dependence of the solubilities of (NH₄)₂PtCl₆ and (NH₄)₂IrCl₆ on the concentration of the NH₄Cl solution.

Solution

This is an example of the common-ion effect:



As the concentration of the NH₄Cl solution is increased, the concentration of the NH₄⁺ ion increases corresponding to Equation (3); as [NH₄⁺] increases, the equilibria (1) and (2) are shifted to the left, in keeping with Le Chatelier's Principle. Thus, the solubility of each of the Pt and Ir compounds decreases as the concentration of the NH₄Cl solution increases.

References

- (1) "Canadian Content" refers to any published chemistry or chemistry-related work from any Canadian institution.
- (2) Benson, Clara C., Jour. Phys. Chem. 7, 116 (1903).
- (3) King, H.S., J. Amer. Chem. Soc. 49, 1500 (1927).
- (4) Eve, A.S., Nature, No.2696, Vol. 107 (June 30, 1921).
- (5) Trost, W.R., and McIntosh, R.L., Can. J. Chem. 29, 508 (1952).
- (6) Archibald, E.H., and Kern, J.W., Trans. R.S.C., Section 3, pp. 7-16, (1917).

Call for Nominations

Nominations are being sought for the 1991 Polysar Awards of the Canadian Society for Chemical Technology for Chemistry Teaching in Community and Technical Colleges. The awards are presented annually to two outstanding teachers in the area of chemistry, biochemistry, chemical engineering technology, or chemical technology. The Awards consist of a \$500 honorarium and assistance towards the travelling expenses of the Award holders to attend the conference at which the Awards are presented.

Nominations for the 1991 Awards close on April 1, 1990. Terms of reference for the Awards and nomination forms may be obtained by writing to: Program Manager, Awards, The Canadian Society for Chemical Technology, 130 Slater Street, Suite 550, Ottawa, Ontario K1P 6E2, (613) 232-6252 or fax (613) 232-5862. □