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NZIC Chemistry IN NEW ZEALAND

ISSN 0110-5566

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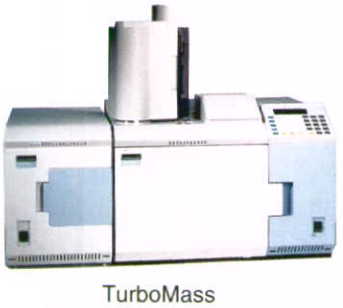

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UP FRONT ...

Chemistry IN NEW ZEALAND

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The New Zealand Institute of Chemistry Incorporated
P O Box 39-283, Howick, Auckland, New Zealand
Phone: +64-9-5356495, Fax: +64-9-5353476
Email: NZICOffice@nzic.org.nz
WWW: http://www.nzic.org.nz
President: Assoc. Prof. G Clark, Hon Treasurer: Dr R S Whitney
General Secretary/Executive Officer: G Boston

Advertising Sales & Publisher:
Robert B Lyon
Ancat Holdings Limited
32 Murvale Drive, Bucklands Beach, Auckland
P O Box 38-546, Howick, Auckland, New Zealand
Phone: +64-9-5353475, Fax: +64-9-5353476
Email: chemistry@ancat.co.nz

Editorial Board:
Dr L J Wright • PhD, MNZIC
Dr R Whiting • PhD, MNZIC
R B Lyon • BSc, MNZIC

Managing Editor:
Robert B Lyon
Ancat Holdings Limited
32 Murvale Drive, Bucklands Beach, Auckland
P O Box 38-546, Howick, Auckland, New Zealand
Phone: +64-9-5353475, Fax: +64-9-5353476
Email: chemistry@ancat.co.nz

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COMING UP ...

March 1999 - Plastics, Resins, Paints, Coatings, IR, Thermal Analysis, Viscosity

May 1999 - Food and Beverage Production and Research, HPLC, LC-MS, Sample Preparation

Deadline for material:
5th of the month of publication

Contributions and enquiries to:
The Editor,
Chemistry In New Zealand,
P O Box 38-546, Howick, Auckland, New Zealand
Phone: +64-9-5353475, Fax: +64-9-5353476
Email: chemistry@ancat.co.nz

COVER STORY

Shimadzu...The GC Company

Any chromatographer recognises Shimadzu as a premier supplier of gas chromatography instrumentation and accessories. Our position in the market is as the supplier offering the best price for performance instruments.

Shimadzu now celebrates its 40th year in the field of GC and we are very proud of the position we have achieved in the market. Shimadzu Scientific Instruments offers not only a range of GC and GC/MS instruments we are also the New Zealand agent for OI Analytical's range of GC instrumentation including head space, purge & trap and specialist detectors. Shimadzu also supplies the premier range of J&W Scientific capillary GC columns and accessories.

SAM (Shimadzu Australia Manufacturing) in Melbourne now manufactures several of the GC and GC/MS ranges, thus making it the only GC and GC/MS manufacturer in Australia.

This enables us to offer a standard fully functional GC/MS complete with computer and printer for NZ $70,000.

Over 50 Australian and New Zealand scientists have chosen the Shimadzu QP-5000 GC/MS systems for their laboratories. Many have come back for second and third systems. Why? Because we offer a variety of models and options to match your budget and requirements. The new QP-5050A series now extends that selection even further.

The QP-5050A offers a 150L Turbo Molecular Pump across the range with a choice of Electron Ionisation (EI), Chemical Ionisation (CI) and Negative Chemical Ionisation modes.

As well, Shimadzu offers Direct Insertion Probes (DIP) and a Pyrolysis system. The DIP allows MS analysis of samples without the chromatography step.

To support our GC/MS users, Shimadzu has an applications chemist available to help you with method development, trouble shooting and training.

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circle number 1 on the reader reply card

CHEM-ED 99

BIENNIAL CONFERENCE OF NEW ZEALAND CHEMISTRY EDUCATORS

Advance Notice

Dates: *27-30 June 1999* **Venue:** *University of Waikato , Hamilton* **Theme:** *Chemistry: Unravelling Mysteries*

This is a conference for all chemistry educators at primary, secondary and tertiary levels hosted by Waikato members of the New Zealand Association of Science Educators and the New Zealand Institute of Chemistry.

The conference will offer delegates the opportunity to hear about current developments in chemistry, both in New Zealand and overseas and to be introduced to contexts in which chemistry has an important role to play.

Keynote speakers include:

- **John Emsley** (Cambridge University Science Writer in Residence) "Communicating Science to the Public"
- **Mary Virginia Orna** (University of New Rochelle) "The Shroud of Turin and Other Mysteries "
- **David Katz** (Cabrina College) "The Chemistry of Toys"
- **Malcolm Carr** (University of Waikato) "Chemistry in Context - A Retrospective View"

A range of workshops and seminars are also offered, including sessions on special effects (the secrets behind Xena , Warrior Princess), Forensic Chemistry and Carbon Dating, plus the usual array of field trips, displays and social events.

For further information or to be put on the mailing list please contact:
Bev Cooper, c/- School of Education , University of Waikato , Private Bag 3105, Hamilton
Phone: (07) 8384382 , Fax: (07) 8384555, Email: bcooper@waikato.ac.nz

NZ Science Scene

FOUNDATION FOR RESEARCH, SCIENCE AND TECHNOLOGY APPOINTS NEW DIRECTORS

"The Foundation for Research, Science and Technology has strengthened its ability to stimulate a culture of innovation with the appointment of four new Directors", said the Minister of Research, Science and Technology, Hon Maurice Williamson.

Mr Williamson recently announced the Governor General's appointment of Neil Richardson, Paula Rebstock, Professor Mason Durie FRSNZ, and Dr Jim Watson to the Foundation. Mr Richardson replaces Sir Neil Waters FRSNZ as Presiding Member. Sir Neil who served a 3-year term was formerly Vice-Chancellor at Massey University and is currently Chairman of the New Zealand Qualifications Authority. Professor Margaret Loutit has been confirmed as Deputy Presiding Member.

Mr Williamson said the new directors reflected the important role the Foundation must make towards the key strategic Government goal of a strongly growing, internationally competitive economy that encourages innovation, new ideas and technologies.

"These people will make a strong impact on the ability of the Foundation to deliver effective science and technology to New Zealand", he said.

They also had a mix of commercial, community and public sector experience that would help to underpin the Foundation's implementation of the results of the Foresight Project.

Neil Richardson

Before moving to New Zealand in 1990 Mr Richardson was a management consultant in Australia working across a wide range of industries in Australia and overseas. In 1990 he became Group Managing Director of the Gallagher Group and a year later Director of WEL Energy Group Limited. Mr Richardson has played a key role in reviewing the long-term funding of research, science and technology in New Zealand, advising on the science reforms in the mid '90s and contributing to the Foresight Project this year.

Mr Richardson is currently the Chairman of Optical Holdings Ltd, RDT Pacific, AgResearch, and MIRINZ. He is Director of numerous other companies and an Adjunct Professor at Waikato University School of Management. He takes up his new appointment with FRST on 1 February 1999.

Dr James Watson

Dr James Watson, is an internationally recognised researcher and leads Genesis Research and Development Corporation Ltd in Auckland.

Genesis is a discovery-based research company operating in collaboration with a number of businesses to develop products of world scale. The partners are pharmaceutical or biotechnology companies, and a plantation forestry company. Genesis has focused on using molecular, genomic and bioinformatic technologies to search for genes and novel regulatory molecules involved in skin and immune system disorders, and plant growth.

Paula Rebstock

Paula is a member of the Commerce Commission and is currently with the Department of Labour as General Manager, Policy. Paula was born in the United States, and after studying at the University of Oregon, worked in the private sector in the United States. She then studied at the London School of Economics, before moving to New Zealand in 1988. Before joining the Department of Labour as General Manager, Policy, she was with the Department of Prime Minister and Cabinet and before that, The Treasury. She has chaired or been a member of a number of major governmental committees and task forces, including employment policy, tax and benefit reform, and immigration.

Professor Mason Durie FRSNZ

Professor Durie is medically qualified, has practised as a psychiatrist, and is a recognised authority on Maori health. He is a member of the National Advisory Committee on Health and Disability Services. He is Head of Maori Studies at Massey University and brings extensive involvement in cultural organisations and community health. In 1994 Professor Durie was elected a Fellow of the Royal Society of New Zealand.

Directors remaining on the FRST Board are:

* Mr Pat Garden, farmer, Central Otago;
* Emeritus Professor Margaret Loutit, retired, Dunedin;
* Mr Rick Christie, formerly CEO, NZ Game Industry Board, now c/-FRST
* Dr Geoff Page, CEO, Industrial Research Limited, Auckland;
* Dr Ian Smith, Vice-Chancellor (Research & International), University of Otago, Dunedin
* Professor Paul Spoonley (co-opted to 30 June 99), Department of Sociology, Massey University, Albany Campus, North Shore, Auckland

ECNZ NATIONAL SCIENCE AND TECHNOLOGY FAIR WINNERS

The 1998 ECNZ National Science and Technology Fair was held at Te Papa during mid-December 1998. The national fair provides an annual opportunity to celebrate excellence in science and technology research projects which has been carried out by students from schools throughout New Zealand. At the fair 36 young students, whose work was selected from that of 55,000 participants in local school and regional fairs, exhibited their science projects.

Premier awards

The ECNZ Premier Award for the most outstanding and meritorious scientific exhibit, went to Form 1 pupil Rebecca Moore from Matarau School in Northland, for a study entitled "Who done it?" that found that wild pigs were the greatest threat to the giant snail in Northland. The award is for travel to represent New Zealand at the London International Youth Science Forum.

Bryn Fenwick from Riccarton High School in Christchurch won the ECNZ Premier Award for the most outstanding and meritorious technology exhibit, with an innovative river pollution trap. The award is for travel to represent New Zealand at the London International Youth Science Forum.

Other awards

ECNZ Award for excellence in science for the second most outstanding and meritorious science exhibit went to Dunedin pupils Tana Wuliji and Lisa Mullen of Otago Girls' High School for their exhibit on "The origins of life". The award is an ECNZ Education Scholarship to the value of $2500.

ECNZ Award for excellence in technology for the second most outstanding and meritorious science exhibit went to Matthew Jervis and Daniel Lodge of Rotorua Boys' High School for their exhibit on "DIP.4.U" - an automatic vehicle headlight dipping system. The prize is an ECNZ Education Scholarship to the value of $2500.

Kiwanis/Travel for Less Award for an outstanding science exhibit where the exhibitor is over the age of 15 years was won by Tana Wuliji and Lisa Mullen of Otago Girls' High School who also won the ECNZ Award for excellence in science. The Kiwanis Award allows the students to travel and participate in the Greater San Diego Science and Engineering Fair in 1999.

IPENZ Travel Award for an outstanding technology exhibit where the exhibitor is over 15 years of age went to Clint Thomas of Te Kauwhata College in the Waikato for his exhibit of a debulber for use as a safe method of light bulb replacement. The award allows the exhibitor to travel to Singapore to the Nanyang Technology and Engineering Research Programme in 1999.

NZ Association of Science Educators Science Fair Travel Award for an outstanding exhibitor of either a science or technology exhibit who is under the age of 15 years went to Ryan Fleming of Glen Eden Intermediate in Waitakere for his exhibit entitled "Do yachties really know what's best?" - Is a rough hull surface finish really slower than a highly polished surface finish? The award allows the exhibitor to visit venues of scientific and/or technological interest within New Zealand to the value of $1000.

A J Park Science Fair Travel Award for an outstanding exhibitor of either a science or technology exhibit who is under the age of 15 years went to Isaac Anstis of Tauranga Boys' College in the Bay of Plenty for his exhibit on "Kiwifruit handling, how rough can you get?". The award allows the exhibitor to visit venues of scientific and/or technological interest within New Zealand to the value of $1000.

The Royal Society of New Zealand Award, made to an outstanding exhibit with no restriction on level of schooling went to Matthew Herbert of St George's School in Wanganui for his exhibit entitled "Safe set up" - a computer programme to assist young people to adjust their work stations appropriate to their size. The award is a $1000 Education Scholarship.

The NIWA award, made to an outstanding exhibit with no restriction on level of schooling went to Nicole Taylor of Hill Top School in Auckland for her exhibit on ""Eggsact timing" - testing the hypothesis that an egg can be boiled perfectly "to your liking" every time if the variables are reduced or made constant. The award is a $1000 Education Scholarship.

NEW LABOUR APPOINTMENTS

Labour has announced a reshuffle of responsibilities among its MPs following the recent resignation of list MP Jill White. Invercargill MP Mark Peck has picked up responsibility for research, science and technology and as spokesman on Crown Research Institutes, while list MP Dianne Yates takes on environment and biosecurity.

MARSDEN FUND

Committee Appointments

Four new members have just been appointed to the Marsden Fund Committee by the Hon Maurice Williamson, Minister of Research, Science & Technology. The Committee now has a membership of ten, previously nine. The new appointees are:

Chairperson - Professor Diana Hill, University of Otago
Deputy Chairperson - Dr Jeffrey Tallon, IRL (currently James Cook Research Fellow)
Member - Professor Paula Jameson, Massey University
Member - Dr Ian Ferguson, HortResearch

Dr Terry Sturm's term has been extended for one year.

Retiring members of the Marsden Fund Committee are the Chairperson (Sir Ian Axford FRS), Deputy Chairperson (Professor Carolyn Burns FRSNZ) and Professor Bob Park FRSNZ.

These members have been on the committee since its inception and they have made a significant contribution to the research community. During this time the Fund has grown to four times its initial size and supports a very broad range of fundamental research fields, now including the humanities. The Royal Society greatly appreciates the time and effort that has been so freely given for the benefit of New Zealand research and looks forward to continuing to work with the committee under its new leadership.

In informing the Royal Society of these appointments, Mr Williamson stated: "I am very pleased to have been able to secure the services of this group of people. They have a diverse range of skills which will effectively complement those of the existing committee members.

"I would also like to take this opportunity to reinforce with the Royal Society of New Zealand, as my agent in the purchase of Marsden Fund outputs, of my expectations of the Royal Society in managing that Fund:

* work closely with the Marsden Fund Chair and Deputy Chair to develop policies and procedures for the administration and management of the Marsden Fund.
* provide advice to me on important management and administration issues facing the Royal Society when distributing the Marsden Fund.
* have a clear understanding of the role of the Marsden Fund within the Science Envelope as just one component of Government's support for basic and non-prioritised research.

* have an understanding of international best practice and an ability to promote the benefits.

"I have every confidence that the Royal Society will continue to manage the Marsden Fund in accordance with my expectations."

Marsden Fund Committee as at 1 January 1999:
Diana Hill - Chairperson
Jeffery Tallon - Deputy Chairperson
Brent Clothier
Terry Sturm
Bruce Baguley
Rob Goldblatt
Robert Franich
David Thorns
Paula Jameson
Ian Ferguson

Marsden Fund - Additional allocations
A review of the forward commitments of the Marsden Fund has given the Marsden Committee the opportunity to make further funding recommendations for some of the full proposals in the 1998 funding round. The full effects of past increases in government funding have been implemented. The Marsden Committee and the Royal Society welcome the opportunity to enhance New Zealand's participation in world class research.

UPSET DECISION ON LABELLING GENETICALLY-MODIFIED FOOD

The Australian and New Zealand Governments were outvoted in a surprise move by a group of Australian states favouring the special labelling of "substantially equivalent" genetically-modified food. The Australia New Zealand Food Standards Council's controversial decision was taken at a meeting held in Canberra in December 1998 attended by New Zealand's Associate Minister of Health, Hon Tuariki Delamere, and his Australian Federal and State counterparts. Not only did the 6-4 decision go against the wishes of the two national governments but it was in conflict with the earlier recommendation of the Australian New Zealand Food Association (ANZFA).

Good manufacturers are warning that a decision favouring the mandatory labelling of some genetically-modified food will be unworkable. Labelling activists are rejoicing at the outcome of the decision. Governments have the task of deciding whether to accept the Standards Council decision and, if so, how to implement it. The Royal Society insists that any labelling requirements imposed must have reasonable validity in scientific terms and not be capable of misinterpretation by the consumer.

RECENT SCITECH RELOCATIONS

SciTech are pleased to have both Sean Patterson and Stephanie Watson now based in Wellington after a recent relocation from Dunedin.

Sean Patterson is experienced in the technical support and sales for the biotechnology, environmental, scientific and analytical, and food technology markets. Sean will be covering the lower half of the North Island.

Stephanie Watson will focus on the biotechnology division. She will be co-ordinating sales, as well as providing technical and application support, nationwide, using her extensive knowledge in the microbiology and molecular genetics fields.

Both Sean and Stephanie can be contacted as follows:
Phone: (04) 8017220, Fax: (04) 8017221
Email: scitechw@scitech.co.nz
Mobile - Sean: 025 2213055
Mobile - Stephanie: 025 476062

1998/99 INTERNATIONAL SCIENCE & TECHNOLOGY (ISAT) LINKAGES FUND (SECOND ROUND)

The second round of funding from the 1998/99 ISAT Linkages Fund has been completed. Applications were of a very high standard with interest shown from researchers in 21 different institutions (8 CRI's, 6 Universities, 1 Research Association, 3 Polytechnics and 3 Private). 32% of the applications were for funding from the Bilateral Research Activities Programme (BRAP); 49% from the NZ/USA Cooperative Science Programme (CSP); and 19% NZ/FRG Scientific and Technological Cooperation Agreement Programme (FRG).

33% of the successful applications were in the BRAP programme; 49% in the CSP programme; and 18% in the FRG programme. The countries involved in the successful BRAP applications include Australia, Japan, Sweden, The Netherlands, and the United Kingdom.

Of the total applications 40% were in the Life Sciences area; 23% in Physical Science / Engineering; 12% in Biochemical and Biomedical; 3% in Mathematical and Information Science); 15% in Earth Sciences and Astronomy; and 7% in Social Sciences.

BRANZ ALPHA AWARDS

The BRANZ ALPHA Award, proudly supported by the Building Research Association of New Zealand, recognises school-community links in science and technology. The award is for $2 000 to those schools which demonstrate vibrant and effective links between the school and the science/technology community of practice. Congratulations go to the following schools recognised for the 1998 year:

Nga Tawa School, Marton
This fairly small school with 229 pupils has established very close links with a local electronics company, PEC, and a local engineering company Ron Burton Engineering, involving them in the teaching in the school, and providing to the companies ideas which have been significantly commercialised, especially in the "Airtrack" system. This technology was devised in the school, and has been enhanced subsequently by further technology projects, and has now been sold to some 60 schools and polytechnics. As befits a school which was in at the start of the CREST Award system, Nga Tawa has a distinguished record in attaining over a third of all the Gold Awards attained in this scheme, from projects which have involved work with a local poultry breeder and a local veterinary practice, as well as with PEC and Ron Burton Engineering. Other links were described with Dairy Research Institute and Massey University.

Whangarei Girls' High School
This school also demonstrated a range of links, particularly involving long-term monitoring of regeneration of a mangrove estuary at Matapouri, in conjunction with Department of Conservation, and monitoring of water quality in two streams close to the school with information going to the Regional

Council. Other links were described with a local dairy company, Northern Bakeries, Northland Pathology Laboratory and the oil refinery at Marsden Point. Though later to join the CREST scheme than Nga Tawa, Whangarei Girls' High School has already had a pupil gain a Gold Award through this scheme, where they use the local council and a local engineering company as consultants and assessors.

A final key element that influenced the judges regarding this entry was that the school is accepting a role as coordinator of professional advancement for teachers and science technicians in other schools in the area, in running an in-service course for technicians, and courses on electronics and genetic engineering.

"GLOBE" TEACHER FELLOW CHOSEN

1999 NZ Science and Technology Teacher Fellow Ann Marie Weir travelled to Williamsburg, Virginia in January to undertake training for Project GLOBE. This project is an international programme which involves school students in monitoring the natural environment, and Ann Marie will be investigating the establishment of the project in New Zealand while on her Fellowship. Hosted by the University of Waikato Geography Department and Landcare Research, she will pilot the programme with local Waikato schools.

For further information on the NZ Science and Technology Teacher Fellowship scheme, see:
http://www.rsnz.govt.nz/awards/index.html or
teachers.fellowships@rsnz.govt.nz

STATEMENT FROM MARK PECK MP

Mark Peck, Labour's recently appointed spokesperson for research, science and technology, is not a scientist. He trained to be a secondary school teacher of history and English and worked for 17 years as a union official with the Service Workers' Union.

So why would someone with little or no science background want to take on such a difficult portfolio? "Simple," says Mark Peck, " - because kids no longer get chemistry sets for Christmas".

"The biotechnology explosion represents the next great wave of scientific progress and New Zealand is uniquely placed to take advantage of the opportunities that will present themselves." But Mark believes this will only happen if, as a country, we move more quickly to value scientists and encourage school-leavers to study for degrees in science, engineering and mathematics.

"New Zealand has more accountants than does Japan. What we need to do now is rapidly develop young minds for the productive, innovative disciplines which science and technology represent. "From science and technology will come the added value high wage jobs we so desperately need if we are ever to break out of the low commodity price spiral we have been in for decades.

"Less than 50 years ago 22% of our work force was employed in producing food. That figure is now about 10%. Unprocessed commodities for export will do nothing to get our economy out of the doldrums."

While Mark agrees that the Government could do more, he is less than impressed with the commitment made by the private sector towards research and development.

"We are, by a factor of four, lagging behind the OECD average for investment in research and development. Our private sector contributes a paltry 0.3% of GDP to research and development. The OECD average is 1.2% while Japan, for instance, receives 2.2%. "It is simple really. Without research we will not patent new ideas. Without new ideas, we will not develop new technologies. This will leave us exposed to those multi-national, former chemical companies who are now making life sciences their own. If we let this happen, we will miss the opportunities that are on our doorstep right now. "The Government cannot and should not do it all, but the Government can lead. It is time we engaged the community in the debate. It is time we said loudly that we value scientists. It is time the Government aggressively challenged the private sector to look past its short term balance sheets. It is time we encouraged local authorities to take part in research and development in the sort of way that the Southland District Council has with its "topoclimate" project, through standing with them as partners.

"One of the things I have noticed as we have moved our country economically, is that the pursuit of money has become the goal of the young. For many young people, degrees in law and accounting are seen as the pinnacles of academic achievement.

"We needs to change our culture so that knowledge and the application of knowledge become valuable goals too. It's time kids again got chemistry sets for Christmas, " says Mark Peck.

BIOMARKERS IN ENVIRONMENTAL TOXICOLOGY

Christchurch
14 - 16 July 1999

The focus of this scientific meeting, will be to critically evaluate the development of biomarkers and identify areas of research that need to be addressed in order to facilitate the application of these tools in risk assessment, screening and environmental monitoring protocols.

Internationally recognised keynote speakers will include:
Dr L Earl Gray Jr, US-EPA, USA
Dr Michael Hooper, TTIEHH, USA
Dr Michael Moore, NRCET, Australia
Dr Jason Weeks, ITE, United Kingdom
Dr Philippe Garrigues, Universite de Bordeaux 1, France

Abstracts for oral and poster presentations (up to 300 words) should be submitted and forwarded to:
Louis Tremblay, Landcare Research, Lincoln
Email: tremblayl@landcare.cri.nz by 15 February 1999

Patent Proze

by Jane Calvert and Greg Lynch

DECIPHERING PATENT SPECIFICATIONS

A patent specification is a document that is filed at a patent office which describes an invention for which protection is sought. Many patent applications are filed initially with a provisional specification. Completion of the application, usually 12 months later, requires the filing of a complete specification. A complete specification typically describes the invention in greater detail than the provisional specification.

Statutory rules, together with other recommended requirements developed over the years from case law, have led to the practice of drafting patent specifications in a certain manner. As a consequence of complying with these requirements and attempting to ensure the best scope of protection possible, a patent specification may not necessarily be a straightforward document to read.

In this Patent Proze, we outline the basic structure of a typical complete specification.

A specification usually begins with an Introduction. This is often one or two sentences identifying the field to which the invention belongs. The Background to the invention, also known as the prior art, typically follows the Introduction. The function of the Background section is to explain what is already known and to highlight any known disadvantages or inadequacies which the invention addresses or overcomes.

In some specifications the Background is followed by one or more statements indicating the object(s) of the invention. The Objects of the Invention are worded with reference to the advantages or problems of the prior art already referred to in the Background. It is, however, important not to overstate in the Objects the alleged advantages of the invention because the validity of a patent may be vulnerable if one or more embodiments of the invention does not, for some reason, meet the stated Objects.

The Statements of Invention follow the Objects. These statements identify the aspects of the invention for which protection is sought. They are the statements which require the most skill from the drafter. Ideally, they will capture the essence of the invention as broadly as possible without including any prior art. The patent can be found to be invalid if prior art does fall within these statements. Typically, a number of subsidiary statements will follow the main Statements of Invention specifying features of the invention which are not essential. In some specifications, the Statements of Invention appear under the heading Summary of Invention. The Objects of the Invention may also be included in this section.

The bulk of a specification usually comprises a Detailed Description of the invention. In this section, reference is often made to any drawings, chemical formulae, experimental details for the synthesis of compounds, preparation of formulations, uses of substances or devices of the invention, or any other specific information which may assist in describing and understanding the invention. It is a statutory requirement that the specification describes the best method of performing the invention. A patent can be invalidated if the most favourable experimental details are withheld from the specification in an attempt to frustrate any person from validly performing the invention, for example when the patent has expired. The technical detail included must be sufficient to enable someone skilled in the art to put the invention into practice without undue experimentation.

A complete specification must include one or more claims. These are the numbered paragraphs at the end of the specification. They generally correspond to the Statements of Invention. The number of claims in a specification can vary widely. Each claim may be an independent or a dependent claim. An independent claim is one which stands alone and makes no reference to another claim. The independent claims define the broadest scope of the invention. Their interpretation is crucial when determining whether an activity is an infringement of existing patent rights.

A dependent claim is a claim which refers to one or more of the independent claims. Dependent claims are used to give specific protection to preferred embodiments of the invention. For example, an independent claim may be directed to a broad class of new compounds, while a dependent claim may be directed to a subset of that class or even a single compound.

While variations in the layout of patent specifications can be evident from one jurisdiction to another, they do tend to follow a roughly similar format. We hope this outline provides some assistance when reading patent specifications. We do, however, point out that the outline is not intended to provide advice on the drafting of patent specifications. Drafting such documents is fraught with pitfalls with the potential for serious adverse financial repercussions - one reason why New Zealand law stipulates that only registered patent attorneys may draft patent specifications on behalf of another person.

Please forward any queries to:
Patent Proze, Baldwin Shelston Waters
P O Box 852, Wellington
Email: email@bswip.co.nz, Internet: www.bswip.co.nz

Jane Calvert

Jane Calvert and Greg Lynch are both employed in the patent department of Baldwin Shelston Waters, Patent and Trademark Attorneys and Solicitors, where they specialise in chemistry patents. Jane joined the firm after completing a PhD in chemistry at the University of Canterbury in 1994. Greg also joined the firm in 1994 after three years research at Industrial Research Limited in Wellington. Following completion of a PhD in chemistry at the University of Otago in 1989, he spent a two year period as a post-doctoral researcher at Oxford in the United Kingdom.

Greg Lynch

Volatile Organic Standards for EPA Method 8260

Elaine Lemoine, Chuck Sadowski and John Purcell
The Perkin-Elmer Corporation, 761 Main Avenue, Norwalk, CT 06859-0010 USA

Quality analytical data is the most important goal of an environmental testing laboratory. After an instrument has been configured and optimised for a specific method, a standard calibration needs to be performed. It is crucial that the standards used in the calibration process are accurate. The first step is to insure that the standards are from a quality stock, shown to be contaminant-free. Stock solution mixes are commercially available (a list of suitable sources appears at the end of this paper). The manufacturer will reference a specific lot number for traceability, and depending on the quality level of the standard, a Certificate of Analysis or Certification Level.

Once a quality standard source has been chosen, it is up to the laboratory to insure that the calibration standards are properly prepared. The method acceptance criteria and the resulting sample results depend on the accuracy of these standards.

Preparing standards can be a laborious, time-consuming process. We recommend that one of the following methods of standard preparation be followed when performing EPA Method 8260. The use of quality, premixed, commercially available standards, prepared as specified in this paper, will help to ensure accurate results with a minimum amount of standard preparation time.

The following stock solutions are required to prepare calibration standards:
BFB (4-Bromofluorobenzene)
(2000 µg/mL)*
Target Compounds
(200 µg/mL)*
Internal Standards
(2000 µg/mL)*
Surrogate Standards
(2000 µg/mL)*
Matrix Spiking Solution
(1000 µg/mL)*

* Once opened, transfer the remaining solutions using Pasteur pipettes into individual 2 mL vials for storage. Cap tightly and store at 4 °C.

Accurate results are highly dependent on the level of care exercised in standard preparation. Each laboratory must determine which option (A or B) is best suited for their particular daily operating procedures. In either case, be consistent!

OPTION A

Secondary Standards*
BFB: Inject 250 µL of Stock BFB into a 10 mL volumetric flask partially filled with methanol (pesticide quality). Fill to the mark for 50 µg/mL (50 ng/µL).

Target Compounds: (see Working Standards)

Internal Standards/Surrogate Standards: Inject 100 µL of Stock Internal Standard Solution and 100 µL of Stock Surrogate Standard Solution into a 10 mL volumetric flask partially filled with methanol (pesticide quality). Fill to the mark for 20 µg/mL.

Matrix Spiking Solution: Inject 100 µL of Stock Matrix Spiking Solution into a 10 mL volumetric flask partially filled with methanol (pesticide quality). Fill to the mark for 10 µg/mL.

*Using Pasteur pipettes, transfer the remaining solutions into individual 2 mL vials for storage. Cap tightly and store at 4 °C.

Working Standards:
BFB : Inject 1 µL of the BFB Secondary Standard Solution through the shutoff valve into a 5 mL syringe containing laboratory pure water. A 1 µL direct injection is also acceptable.

Calibration Standards: Inject 5 µL of the Stock Target Compound Standard into a 100 mL volumetric flask containing laboratory pure water (filled to the mark). Invert the flask three times to mix. Discard the contents in the neck of the flask prior to filling a 5 mL syringe. This will yield a 10 ppb Calibration Standard. Repeat this procedure using a 10 µL aliquot for a 20 ppb Calibration Standard . Repeat this procedure using a 25 µL aliquot for a 50 ppb Calibration Standard. Repeat this procedure using a 50 µL aliquot for a 100 ppb Calibration Standard. Repeat this procedure using a 100 µL aliquot for a 200 ppb Calibration Standard.

Initial Calibration Concentrations

µL/100 mL	Final Concentration (ppb)
5	10
10	20
25	50
50	100
100	200

Continuing Calibration Concentration*

µL/100 mL	FinalConcentration (ppb)
25	50

* The Continuing Calibration Standard is to be prepared daily.

Internal/Surrogates:
Inject 25 µL of the Secondary Internal/Surrogate Standard Solution through the shutoff valve into each 5mL syringe

containing standards, blanks, samples, matrix spikes, duplicates, and QC samples, providing standard concentrations of 100 ppb.

Matrix Spike:
Inject 25 µL of the Secondary Matrix Spiking Solution into two replicate 5 mL syringes containing a sample which is being analysed with this sequence. This yields an initial concentration of 50 ppb.

OPTION B

Secondary Standards*
BFB: Inject 250 µL of Stock BFB into a 10 mL volumetric flask partially filled with methanol (pesticide quality). Fill to the mark for 50 µg/mL (50 ng/mL).

Calibration Standards: Inject 500 µL of Stock Target Compound Solution into a 10 mL volumetric flask partially filled with methanol (pesticide quality). Fill to the mark for 10 µg/mL.

Internal Standards/Surrogate Standards:
Inject 100 µL of Stock Internal Standard Solution and 100 µL of Stock Surrogate Standard Solution into a 10 mL volumetric flask partially filled with methanol (pesticide quality). Fill to the mark for 20 µg/mL.

Matrix Spiking Solution: Inject 100 µL of Stock Matrix Spiking Solution into a 10 mL volumetric flask partially filled with methanol (pesticide quality). Fill to the mark for 10 µg/mL.

*Using Pasteur pipettes, transfer the remaining solutions into individual 2 mL vials for storage. Cap tightly and store at 4 °C.

Working Standards:
BFB: Inject 1 µL of the BFB Secondary Standard Solution through the shutoff valve into a 5 µL syringe containing laboratory pure water. A 1 µL direct injection is also acceptable.

Initial Calibration Concentrations

µL/5 mL Standard Mix	µL/5 mL Methanol	Final Concentration (ppb)
5	95	10
10	90	20
25	75	50
50	50	100
100	0	200

Continuing Calibration Concentration*

µL/5 mL Standard Mix	µL/5 mL Methanol	Final Concentration (ppb)
25	75	50

* The Continuing Calibration Standard is to be prepared daily.

Calibration Standards: Inject 5 µL of the Secondary Target Compound Solution through the shutoff valve into a 5 mL syringe containing 5 mL of laboratory pure water (pull the syringe barrel back to allow enough head room for standards). Inject 95 µL of methanol through the shutoff valve into this same syringe. This will yield a 10 ppb Calibration Standard. Repeat this procedure using a 10 µL aliquot and 90 µL of methanol for a 20 ppb Calibration Standard. Repeat this procedure using a 25 µL aliquot and 75 µL of methanol for a 50 ppb Calibration Standard. Repeat this procedure using a 50 µL aliquot and 50 µL of methanol for a 100 ppb Calibration Standard. Repeat this procedure using a 100 µL aliquot for a 200 ppb Calibration Standard.

Internal/Surrogates: Inject 25 µL of the Secondary Internal/Surrogate Standard Solution through the shutoff valve into each 5 mL syringe containing standards, blanks, samples, matrix spikes, duplicates, and QC samples, providing standard concentrations of 100 ppb.

Matrix Spike: Inject 25 µL of the Secondary Matrix Spiking Solution into two replicate 5 mL syringes containing a sample which is being analysed with this sequence. This yields an initial concentration of 50 ppb.

Some Standard Sources:
Perkin-Elmer
Ultra Scientific
Supelco
AccuStandard

CONFERENCES & SEMINARS

2-5 March 1999

Chemexpo

An international trade exhibition for the chemical industry, which will specifically focus on the plastic, rubber, corrosion protection and pharmaceutical industries.

Venue: Budapest, Hungary

Contact: Szilvia Rozsa
Project Director, Hungexpo Co,
Chemexpo Project
H-1441, Budapest, P O Box 44, Hungary

4-5 March 1999

Industrial Biocatalysts

Industrial Biocatalysts in pharmaceutical and fine chemicals.

Venue: Amsterdam, The Netherlands

Contact: Spring Innovations
185A Moss Lane, Biamhall, Stockport
Cheshire SK7 1BA, England, United Kingdom
Tel: (+44-161)-4400082
Fax: (+44-161)-4409127

15-17 March 1999

Advanced Methods of Polymer Characterisation: New Developments and Applications in Industry

Venue: Mainz, Germany

Contact: Deutsche Bunsen-Gesellschaft
fur Physikalische Chemie
Varrentrappstrasse 40-42
D-60486 Frankfurt am Main, Germany

18-19 March 1999

Centre for Advanced Engineering (CAE), University of Canterbury "Assessment of Environmental Effects" with two keynote addresses by Dr Barry Sadler, Chief Executive of the United Kingdom Institute of Environmental Assessment.

Venue: Wellington, New Zealand

Contact: j.lumsden@cae.canterbury.ac.nz

29-31 March 1999

4th International Conference on Separations for Biotechnology

Venue: University of Reading, England, United Kingdom

Contact: Professor D L Pyle
Tel: +44-118-9318717
Fax: +44-118-9310080

7-15 April 1999

BCA/CCG Seventh Intensive Course in X-Ray Structural Analysis

Venue: Durham, England, United Kingdom

Contact: J A K Howard
'BCA/CCG Intensive Course'
Department of Chemistry
University of Durham
Durham, DH1 3LE, England, United Kingdom
Fax: (+44-191)-3743745
Email: j.a.k.howard@durham.ac.uk

14-16 April 1999

TiO_2 99 - New Strategies In An Era of Industry Rationalisation

Venue: Padova, Italy

Contact: Melanie Searle
Intertech Conferences
411 US Route One, Portland, Maine 04105, USA
Tel: (+1-207)-7819800
Fax: (+1-207)-7812150

19-21 April 1999

Carbon Black World 99

Venue: Venice, Italy

Contact: Karen Zacharias
Intertech Conferences
411 US Route One, Portland, Maine 04105, USA
Tel: (+1-207)-7819800
Fax: (+1-207)-7812150

26-28 April 1999

Drug Discovery Technologies '99 - Selecting and Shaping the Winning Compounds

Venue: Amsterdam, The Netherlands

Contact: Alison Singhal
IBC Global Conferences
Gilmoora House
57-61 Mortimer Street, London W1N 8JX
England, United Kingdom
Tel: (+44-171)-4535491
Fax: (+44-171)-6366858

3-4 May 1999

Chiral USA

Covering chiral technology as applied to the pharmaceutical, agrochemical and fine chemical industries.

Venue: San Francisco, USA

Contact: Spring Innovations
185A Moss Lane, Biamhall, Stockport
Cheshire SK7 1BA, England, United Kingdom
Tel: (+44-161)-4400082
Fax: (+44-161)-4409127

5-7 May 1999

The 1999 British Association of Research Quality Assurance (BARQA) International Congress on The Changing Face Of Quality Assurance

Venue: Dublin, Ireland

Contact: Veronica Fernando
Veritus Consulting
Box Cottage, Church Road, North Waltham
Hants RG25 2BL, England, United Kingdom

12-23 May 1999

Crystal Engineering: From Molecules and Crystals to Materials

Venue: Erice, Italy

Contact: P Spadon
Email: paola@pdchor.unipd.it

Web Site: www.geomin.unibo.it/orgv/erice/crysteng.htm

CONFERENCES & SEMINARS

17-21 May 1999

The 2nd International Conference on Microplate Technology, Laboratory Automation and Robotics (MipTech-ICAR'99)

Venue: Montreux, Switzerland

Contact: Bureco
Postfach, CH-4310 Rheinfelden, Switzerland

31 May - 4 June 1999

4th International Symposium on Functional Dyes

Venue: Osaka, Japan

Contact: Professor Yasuhiko Shirota
Faculty of Engineering, Osaka University
Yamadaoka, Suita, Osaka 565-0871, Japan
Tel: (+81-6)-8797364
Fax: (+81-6)-8777367
Email: isfd@chem.eng.osaka-u.ac.jp

3-6 June 1999

Heleco '99

A conference and exhibition focusing on environmental technology for the 21st century, Heleco '99 will be divided into five topic areas - water, atmosphere, solid waste, environmental management, and urban design and the environment.

Venue: Thessaloniki, Greece

Contact: Horizon
14 Nikis Street, 105 57 Athens, Greece

7-10 June 1999

3rd International Symposium on Molecular Mobility and Order in Polymer Systems

Venue: St Petersburg, Russia

Contact: Symposium Chairman
Professor A A Dariskii
or Mrs I Kovalenko
Institute of Macromolecular Compounds
Bolshoy pr. 31, St Petersburg, 199004 Russia
Tel: (+7-812)-2132907
Fax: (+7-812)-2186869
Email: IMC@macro.spb.su

8-10 June 1999

ET'99

Integrated event covering management, technology and services in the water, waste and environmental sectors.

Venue: Birmingham, England, United Kingdom

Contact: Jim Hughes
Reed Exhibition Companies
Oriel House, 26 The Quadrant, Richmond
Surrey TW9 1DL, England, United Kingdom

8-11 June 1999

International Food Machinery & Technology Exhibition (FOOMA Japan '99)

Venue: Tokyo International Exhibition Center, Tokyo, Japan

Contact: Secretariat of the International Food Machinery & Technology Exhibition (FOOMA Japan), Kasumigaseki Bldg. 12F, 3-2-5, Chiyoda-ku, Tokyo 100-6012, Japan
Tel: +81-3-35037661
Fax: +81-3-35037620

20-25 June 1999

CHEMRAWN XII - African Food Security and Natural Resource Management: The New Scientific Frontiers

Venue: Nairobi, Kenya

Contact: Dr Pedro Sanchez
International Centre for Research in Agroforestry
P O Box 30677, Nairobi, Kenya
Tel: (+254-2)-521003
Fax: (+254-2)-520023
Email: p.sanchez@cgnet.com

27-30 June 1999

CHEM-ED 99. Biennial Conference of New Zealand Chemistry Educators - Chemistry: Unravelling Mysteries

Venue: University of Waikato, Hamilton, New Zealand

Contact: Bev Cooper
c/- School of Education, University of Waikato
Private Bag 3105, Hamilton
Tel: (+64-7)-8384382
Fax: (+64-7)-8384555
Email: bcooper@waikato.ac.nz

28 June - 2 July 1999

International Memorial K I Zamaraev Conference on Physical Methods for Catalytic Research at the Molecular Level

Venue: Novosibirsk, Russia

Contact: Professor V N Parmon
Boreskov Institute of Catalysis
5, Prosp. Akad. Lavrentieva,
Novosibirsk, 630090, Russia
Tel: (+7-383)-2343269
Fax: (+7-383)-234056
Email: parmon@catalysis.nsk.su

3-7 July 1999

IV Liquid Matter Conference

Venue: University of Granada, Granada, Spain

The Conference is sponsored by the European Physical Society and the University of Granada. The scope of the IV Liquid Matter Conference is rather broad and the program is based on the following twelve Symposia, entitled: simple liquids and solutions, classical and quantum; molecular liquids and reaction dynamics; ionic liquids and liquid metals; liquid crystals; polymers, polyelectrolytes and gels; colloids, surfactants, emulsions and foams; membranes and biological liquids; fluids in confined geometries, films and interfacial phenomena; supercooled liquids and glasses; phase transitions and nucleation phenomena; rheological properties of liquids; and powder and other granular matter.

Contact: Professor Dr Roque Hidalgo-Álvarez
Departamento de Física Aplicada
Universidad de Granada
Campus de Fuentenueva
E-18071 Granada, Spain

Tel: (+34-58)-243213
Fax: (+34-58)-243214
Email: liquid99@ugr.es
Web Site: http://www.ugr.es/~liquid99

4-9 July 1999
Australian International Symposium on Analytical Sciences
Venue: Melbourne Exhibition and Convention Centre
Melbourne, Victoria, Australia
AISAS 99 promises to offer a scientific program of the highest quality with general analytical and chromatography/separation science streams featuring key international speakers and local experts, while at the same time providing an extensive trade exhibition and commercial workshops. Make sure you are part of this historic event. Start thinking about your paper/poster abstract now.
Contact: Associate Professor Philip Marriott
Chair Organising Committee
Tel: (+61-3)-99251786
Fax: (+61-3)-96391321
Email: AISAS@rmit.edu.au
Website: http://www.chem.monash.edu.au/raci/index.html

5-7 July 1999
The New Zealand Statistical Association 50th Anniversary Conference
Venue: Victoria University, Wellington
Contact: nzsa99@mcs.vuw.ac.nz
Possible sections include history, medical statistics, statistics education, data mining, and risk management. Papers in these and other areas will be welcome. The main source of information will be a conference web page that will be running from December 1998 via the web page belonging to the School of Mathematical and Computing Sciences, at Victoria University of Wellington.
Website: http://www.mcs.vuw.ac.nz/

Information and facilities available will include:
* A listing of accommodation options and approximate prices - it will be the responsibility of registrants to find their own accommodation.
* Procedure for registering and submitting abstracts.
* Timetable and listings of invited and contributed talks, which will be updated as the programme develops.

5-9 July 1999
VIII SCAR International Symposium on Antarctic Earth Sciences
Venue: Wellington, New Zealand
Contact: Dr Fred Davey
Institute of Geological and Nuclear Sciences
P O Box 1320, Wellington, New Zealand
Tel: (+64-4)-5701444
Fax: (+64-4)-4710977
Email: ISAES@qns.cri.nz

11-15 July 1999
2nd International Conference on Biodiversity and Bioresources - Conservation and Utilisation
Venue: Belo Horizonte, Minas Gerais, Brazil
Contact: Professor Alaide Braga de Oliveira
Faculdade de Farmacia - UFMG
Av. Olegario Maciel 2360
30.180112 Belo Horzonte, Brazil
Fax: (+55-31)-3379076
Email: fernao@dedalus.lcc.ufmg.br

12-15 July 1999
39th Microsymposium, Advances in Polymerisation Methods: Controlled Synthesis of Functionlised Polymers
Venue: Prague, Czech Republic
Contact: Dr Jaromir Lukas
Institute of Macromolecular Chemistry
Academy of Sciences of the Czech Republic
Heyovskeho na. 2, 162 06 Praha 6
Czech Republic
Tel: (+420-2)-360341
Fax: (+420-2)-367981
Email: sympo@imc.cas.cz

14-16 July 1999
Biomarkers in Environmental Toxicology
Venue: Christchurch, New Zealand
Contact: Louise Tremblay
Landcare Research, Lincoln
Email: tremblayl@landcare.cri.nz

15-17 July 1999
1st IUPAC Workshop on New Directions in Chemistry. Workshop on Advanced Materials: Nanostructured Systems
Venue: Hong Kong
Contact: Professor M A El-Sayed
School of Chemistry and Biochemistry
Georgia Institute of Technology, Atlanta
GA 303320400, USA
Tel: (+1-404)-8940292
Fax: (+1-404)-8940294
Email: mostafa.el-sayed@chemistry.gatech.edu

18-22 July 1999
10th International Symposium on Organo-Metallic Chemistry Directed Towards Organic Sythesis (OMCOS 10)
Venue: Versailles, France
Contact: Professor J P Genet
Laboratoire de Synthese Selective Organique
et Produits Naturels
E N S C P - UMR CNRS 7573
11 rue Pierre et Marie Curie
75231 Paris Cedex 05, France
Tel: (+33-1)-44276743
Fax: (+33-1)-44071062
Email: genet@ext.jussieu.fr

18-23 July 1999
12th International Symposium on Carotenoids
Venue: Cairns, Australia
Contact: Professor George Britton
School of Biological Sciences

The University of Liverpool
Crown Street, Liverpool, L69 3BX
England, United Kingdom
Fax: (+44-151)-7944349

19-22 July 1999
19th Discussion Conference on the Rheology of Polymer Systems
Venue: Prague, Czech Republic
Contact: Dr Jaromir Lukas
Institute of Macromolecular Chemistry
Academy of Sciences of the Czech Republic
Heyovskeho na. 2, 162 06 Praha 6
Czech Republic
Tel: (+420-2)-360341
Fax: (+420-2)-367981
Email: sympo@imc.cas.cz

19-23 July 1999
International Symposium on Ionic Polymerisation
Venue: Kyoto, Japan
Contact: Dr Shiro Kobayashi
Department of Materials Chemistry
Graduate School of Engineering
Kyoto University, Kyoto 606-01, Japan
Tel: (+81-75)-7535608
Fax: (+81-75)-7534911
Email: kobayashi@mat.polym.kyoto-u.ac.jp

25-30 July 1999
14th International Conference on the Chemistry of the Organic Solid State
Venue: Cambridge, England, United Kingdom
Contact: Email: ICCOSSXIV@ch.cam.ac.uk

25-30 July 1999
Analytical Science into the Next Millenium (SAC 99)
Venue: Dublin, Ireland
Contact: Professor Malcolm R Smyth
Faculty of Science
Dublin City University, Dublin 9, Ireland
Tel: (+353-1)-7045308
Fax: (+353-1)-7045503
Email: smythm@dcu.ie

26-30 July 1999
6th International Conference on the Structure of Surfaces
Venue: Vancouver, Canada
Contact: K A R Mitchell
Department of Chemistry
University of British Columbia
Vancouver, BC V6T 1Z1, Canada
Email: karm@chem.ubc.ca
Web Site: www.conferences.ubc.ca/icsos.htm

26-31 July 1999
XXVI International Conference on Solution Chemistry
Venue: Fukuoka City, Kyushu, Japan
Contact: Professor Hitoshi Ohtaki
Department of Chemistry
Faculty of Science and Engineering
Ritsumeikan University, 1-1-1 Noji-Higashi
Kusatsu 525, Japan
Tel: (+81-775)-612777
Fax: (+81-775)-612659
Email: ohtaki@bkc.ritsumei.ac.jp

1-6 August 1999
Eleventh American Conference on Crystal Growth and Epitaxy
Venue: Tucson, Arizona, USA
Contact: T Gentile
ACCGE-11 Sec.
P O Box 3233, Thousand Oaks
CA 91359-0233, USA
Fax: (+1-805)-4924062
Email: aacg@lafn.org
Web Site: www.aml.arizona.edu/aacg

4-13 August 1999
18th IUCr General Assembly and International Congress of Crystallography
Venue: Glasgow, Scotland, United Kingdom
Web Site: www.chem.gla.ac.uk/iucr99/

6-13 August 1999
Frontiers in Chemistry: Molecular Basis of the Life Sciences
Venue: Berlin, Germany
Contact: IUPAC Secretariat
Tel: (+1-919)-4858700
Fax: (+1-919)-4858706
Email: secretariat@iupac.org

14-19 August 1999
IUPAC Congress
Venue: Berlin, Germany
Contact: Gesellschaft Deutscher Chemiker - GDCh
P O Box 90 04 40
60444 Frankfurt Am Main, Germany
Tel: (+49-69)-7917 358/360/366
Fax: (+49-69)-7917475
Email: tg@gdch.de

22-27 August 1999
Flavour Release: Linking Experiments, Theory and Reality. A Joint American Chemical Society/Royal Society of Chemistry Symposium
Venue: New Orleans, Louisiana, USA
Contact: Andy Taylor
Tel: +44-115-9516144
Fax: +44-115-9516154
Email: andy.taylor@nottingham.ac.uk

1-30 September 1999
ECSOC-3 - 3rd Electronic Conference on Synthetic Organic Chemistry
Organised by Molecular Diversity Preservation International
Contact: Dr Esteban Pombo-Villar

ECSOC-3 Chairman
Preclinical Research, Novartis Pharma AG
CH-4002 Basel, Switzerland
Tel: (+41-61)-3249865
Fax: (+41-61)-3249794
Email: esteban.pombo@pharma.novartis.com
or Dr Shu-Kun Lin
ECSOC-3 Secretary
Molecular Diversity Preservation International
Saengergasse 24
CH-4054 Basel, Switzerland
Tel: (+41-79)-3223379
Fax: (+41-61)-3028918
Email: lin@mdpi.org
Website: http://www.mdpi.org/ecsoc-3.htm

6-10 September 1999
8th International Symposium on Macromolecule-Metal Complexes (MMC-VIII)
Venue: Tokyo, Japan
Contact: Professor Eishun Tsuchida
Waseda University
Tokyo 169-50, Japan
Tel: (+81-3)-52863120
Fax: (+81-3)-32095522
Email: w169988@mn.waseda.ac.jp

21-24 November 1999
1999 NZIC Conference: Chemistry in New Zealand - A Showcase of Activities and Opportunities
Venue: Victoria University of Wellington, Wellington
Contact: Associate Professor Jim Johnston
Victoria University of Wellington
or Conference Office
School of Chemical and Physical Sciences
Victoria University of Wellington
Email: Margaret.Brown@vuw.ac.nz
Website: www.vuw.ac.nz/chemistry/nzic99

December 1999
23rd Australian Polymer Symposium
Venue: Geelong, Victoria, Australia
Contact: Dr W D Cook
Department of Materials Engineering
Monash University
Clayton, VIC 3168, Australia
Tel: (+61-3)-99054926
Fax: (+61-3)-99054940
Email: WDCOOK@eng2.monash.edu.au

13-17 December 1999
International Conference on Cleaner Production and Sustainable Development '99
Venue: Taipei International Convention Centre, Taipei
Taiwan, Republic of China
Contact: Dr Young Ku, Professor
Chairman of Academic Committee
Department of Chemical Engineering
National Taiwan University of
Science and Technology
43, Sec.4, Keelung Road, Taipei, Taiwan
Republic of China
Tel: (886-2-27376621)
Fax: (886-2-27376644)
Email: ku@ch.ntust.edu.tw

February 2000
5th IUPAC Symposium on Bio-Organic Chemistry
Venue: New Delhi, India
Contact: Professor S Ranganathan
Biomolecular Research Unit
Regional Research Laboratory
Trivandrum 695 019, India
Tel: (+91-471)-491459
Fax: (+91-474)-490186

6-11 February 2000
RACI 11th National Convention
Venue: Canberra, ACT, Australia
Contact: Dr W D Cook
Department of Materials Engineering
Monash University
Clayton, VIC 3168, Australia
Tel: (+61-3)-99054926
Fax: (+61-3)-99054940
Email: WDCOOK@eng2.eng.monash.edu.au

19-23 March 2000
Water 2000 Conference and Expo - "Guarding the Global Resource"
Venue: Auckland, New Zealand
Contact: New Zealand Water and Wastes Association
P O Box 13880
Onehunga, Auckland, New Zealand
Tel: (+64-9)-6363636
Fax: (+64-9)-6361234
Email: water@nzwwa.co.nz
Website: http://www.nzwwa.org.nz

2-5 April 2000
Foods - Nutraceuticals - Confectionary - Beverages & Cosmetics
Venue: Doubletree Mission Valley Hotel, San Diego, California, USA
Contact: Mr P C Hereld,
Managing Director
The Hereld Organisation
200 Leeder Hill Drive
Hamden CT 06517, USA
Tel/Fax: +1-203-2816766

4-10 April 2000
10th International Conference on High Temperature Materials Chemistry
Venue: Aachen, Germany
Contact: Professor K Hilpert
Forschungszentrum Julich GmbH
Institut fur Werkstoffe der Energietechnik (IWE I)

52425 Julich, Germany
Tel: (+49-2461)-613280
Fax: (+49-2461)-613699
Email: k.hilpert@fz-juelich.de

1-5 July 2000
13th International Conference on Organic Synthesis
Venue: Warsaw, Poland
Contact: Professor M Chmielewski
Institute of Organic Chemistry
Kasprzaka 44, 01-224 Warsaw 42
P O Box 58, Poland
Tel: (+48-22)-6318788
Fax: (+48-22)-6326681
Email: ichos@ichf.edu.pl

9-14 July 2000
38th International Symposium on Marcromolecules
Venue: Warsaw, Poland
Contact: Professor Stanislaw Penczek
Polish Academy of Sciences
ul. Sienkiewicza 112, 90363 Lodz, Poland
Tel: (+48-42)-6819815
Fax: (+48-42)-6847126
Email: spenczek@bilbo.cbmm.lodz.pl

9-14 July 2000
34th International Conference on Coordination Chemistry
Venue: Edinburgh, Scotland, United Kingdom
Contact: Professor P Tasker, Chairman
Dr John F Gibson, Secretary
The Royal Society of Chemistry
Burlington House, London W1V OBN
England, United Kingdom
Tel: (+44-171)-4403321
Fax: (+44-171)-7341227
Email: gibsonj@rsc.org

17-20 July 2000
40th Microsymposium on Polymers In Medicine
Venue: Prague, Czech Republic
Contact: Dr Jaromir Lukas
Institute of Macromolecular Chemistry
Academy of Sciences of the Czech Republic
Heyovskeho na. 2, 162 06 Praha 6
Czech Republic
Tel: (+420-2)-360341
Fax: (+420-2)-367981
Email: sympo@imc.cas.cz

6-11 August 2000
16th IUPAC Conference on Chemical Thermodynamics
Venue: Halifax, Nova Scotia, Canada
Contact: Dr Peter G Kusalik
Department of Chemistry
Dalhousie University
Halifax, Nova Scotia B3H 4J3, Canada
Tel: (+1-902)-4943627
Fax: (+1-902)-4941310
Email: kusalik@is.dal.ca

14-18 August 2000
12th International Conference on Thermal Analysis and Calorimetry
Venue: Copenhagen, Denmark
Contact: Dr O Toft Sorensen
Risoe National Laboratory
Fax: (+45)-46351173

1 September 2000
22nd International Symposium on the Chemistry of Natural Products
Venue: Sao Paulo, Brazil
Contact: Dr M Fatima das G F da Silva
Universidade Federal de Sao Carlos
Depto. de Quimica, Via Washington Luiz
km 235, CP676, Sao Carlos, Brazil
Tel: (+55-16)-2748208
Fax: (+55-16)-2748350
Email: dmfs@power.ufscar.br

3-8 September 2000
11th International Biotechnology Symposium
Venue: Berlin, Germany
Contact: Professor G Kreysa
DECHEMA eV
c/o 11th IBS, Theodor-Heuss-Allee 25
60486 Frankfurt/Main, Germany
Tel: (+49-69)-7564205
Fax: (+49-69)-7564201
Email: info@dechema.de

14-19 December 2000
Pacifichem 2000
Venue: Waikiki, Honolulu, Hawaii
Contact: Professor B Halton
Department of Chemistry
Victoria University of Wellington
P O Box 600
Wellington, New Zealand
Fax: (+64-4)-4955241
Email: brian.halton@vuw.ac.nz

26 August - 1 September 2001
XXXIV International Congress of Physiological Sciences "From Molecule to Malody"
Venue: Christchurch, New Zealand
Contact: The Conference Company
P O Box 90-040, Auckland, New Zealand
Tel: (+64-9)-3601240
Fax: (+64-9)-3601242
Email: info@tcc.co.nz

Gas Chromatography and GC-MS Focus Feature

HP INTRODUCES SMALL, EASY-TO-USE, RUGGED GAS CHROMATOGRAPH SYSTEM FOR ROUTINE, SINGLE-CHANNEL ANALYSES - IN THE LAB OR AT-LINE

Hewlett-Packard Company recently introduced the HP 6850 Series gas chromatograph (GC) system, a small, rugged, easy-to-use, single-channel GC designed for customers conducting routine analyses in support of chemical, petrochemical and petroleum production operations.

Customer-Centered Design
The new system was defined and designed in collaboration with hundreds of customers who support production operations. These users need maximum return on bench space because they typically dedicate one GC channel per specific test and often must run many tests to determine process efficiency or product quality. Less than half the width of a standard GC, the HP 6850 GC meets their need for optimal use of available bench space.

The HP 6850 system uses many of the same components as the industry-leading HP 6890 platform and retains many of its features, including excellent chemical performance, unsurpassed retention-time stability, superior reliability and outstanding durability in harsh conditions. Integrated electronics, HP's fourth-generation electronic pneumatics control and a new sampling-valve design, which is expected to last three or more times longer between failures than current valve technology, contribute to system reliability.

Simplicity Redefined
The HP 6850 GC is designed to be easy to learn and operate, allowing technicians and operators - not just highly trained chromatographers - in a production laboratory or at-line environment to perform tests. The front panel of the GC has just six buttons, making it extremely easy for users of any skill level to select a method, start or stop a run and obtain instrument status.

The chemist, who develops and supports the method, may use one of the following user interfaces with the HP 6850 GC:

- a detachable, hand-held controller, based on HP palmtop PC technology, which employs graphical displays and function keys that make the controller much simpler to use than conventional GC keyboards; and
- HP Multitechnique ChemStation, which includes the HP ChemStation Companion, a simple interface designed specifically for the production environment.

The developer can even create methods on a similarly configured HP 6890 system and transfer the method directly to the HP 6850 GC. Because both the HP 6890 and HP 6850 GCs support retention-time locking, method transfer can be accomplished quickly and with minimum effort.

The oven is accessed through the GC's top-opening lid, which makes column replacement faster, easier and safer than GCs with front-opening oven doors. This new oven design gives the user unobstructed access to the column connections at the inlet and detector.

Better Process Control
The small size, simplicity and ruggedness of the HP 6850 Series GC make it well-suited for at-line measurements, allowing users to get answers faster and in turn keep production processes operating at maximum efficiency.

Another way to get answers more quickly is to convert existing methods to fast GC. The small size of the HP 6850 GC needed a column oven significantly smaller than those of conventionally sized GCs. The smaller oven allows very fast temperature ramp-ups and short cool-down times - important requirements for fast GC. The HP 6850 GC also uses the HP 6890 FID, which can acquire data at rates up to 200 Hz.

Contact: Medtec Products Limited
P O Box 34-241, Birkenhead, Auckland
Phone: (09) 4791068, Fax: (09) 4791450
Email: phermans@medtec.co.nz
Website: http://www.medtec.co.nz
circle number 21 on the reader reply card

HP APPLICATION NOTE DESCRIBES PESTICIDE ANALYSIS USING LARGE-VOLUME INJECTION WITH THE HP 6890 SERIES GC AND HP 5973 MSD

Hewlett-Packard Company recently published an application note (Literature 5966-1214E) titled "Trace Level Pesticide Analysis by GC/MS Using Large-Volume Injection."

The application note describes the analysis of pesticides in several food extracts using large-volume injection with the HP programmable temperature vapourising (PTV) inlet, an HP 6890 Series automatic liquid sampler, an HP 6890 Series gas chromatograph (GC) and an HP 5973 mass selective detector (MSD). The PTV permitted injection volumes as large as 100 µL, which allowed identification of several pesticides by scanning GC/MSD at the 100-ppt (100 ng/L) level. The PTV was able to tolerate dirty food extracts very well, with more than 1,500 µL of such samples injected into a single PTV liner.

The publication also includes a brief tutorial on the use of the HP PTV for large-volume injections.

The application note is available without charge from any Medtec office.

Information about HP chemical analysis products and services can be found on the World Wide Web at http://www.hp.com/go/chem

Contact: Medtec Products Limited
P O Box 34-241, Birkenhead, Auckland
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Email: phermans@medtec.co.nz
Website: http://www.medtec.co.nz
circle number 22 on the reader reply card

PFLEGER/MAURER/WEBER DRUG AND PESTICIDE LIBRARY IS NOW AVAILABLE

The Pfleger/Maurer/Weber Drug and Pesticide Library Version 1.0 (P/N 4308523) is now available for the Perkin Elmer Turbomass GC/MS. It is the "standard" mass spectral reference library for drugs of abuse, forensic, and pharmaceutical applications.

The library includes an easy to use setup procedure and, therefore, service installation is neither necessary nor required.

The Pfleger/Maurer/Weber library consists of a set of TurboMass formatted library files that contain mass spectral information for 4367 drugs of abuse, related surrogates and interferents. In addition, a set of books are provided with the library; Mass Spectral and GC Data of Drugs, Poisons, Pesticides, Pollutants and Their Metabolites, Parts. 1, 2, and 3 by K. Pfleger, H. H. Maurer, and A. Weber.

Contact: Peter Hall, Perkin-Elmer Pty Ltd
Free Phone: 0800 776767, Free Fax: 0800 776000
Email: perkin-elmer@clear.net.nz
Internet: http://www.perkin-elmer.com
circle number 23 on the reader reply card

HP INTRODUCES RETENTION TIME LOCKING SOFTWARE FOR THE HP 6890 GAS CHROMATOGRAPHY SYSTEM

Hewlett-Packard have introduced retention time locking (RTL) software, a powerful new productivity tool for the HP 6890 gas chromatography (GC) system.

RTL is an HP innovation that takes advantage of the outstanding retention-time reproducibility possible with HP's third-generation electronic pneumatics control (EPC). RTL allows capillary GC users to reproduce chromatograms with the same retention times on different HP 6890 systems with EPC. Gas chromatography results are now independent of the GC configuration (for example, inlet or detector), location or operator. RTL also can compensate for differences in nominal column length. Operators around the world can obtain the same chromatograms whether they are using an HP 6890 GC with a flame ionisation detector at atmospheric pressure, a mass selective detector at vacuum or an atomic emission detector at an elevated pressure.

The RTL software can be used by method developers to lock a method using a single compound (the locking compound) in their typical standard mixtures. The software establishes the relationship between the pressure and retention time. Once known, this relationship is used to lock the method on any HP 6890 GC system equipped with EPC.

To lock another system, an operator makes a single run using the standard and enters the retention time of the locking compound into the software. The software calculates the new inlet pressure required to match the chromatogram to the chromatogram obtained from the original HP 6890 GC system. The software also can update the method with the new pressure automatically. With RTL, calibrating capillary-GC retention times becomes as familiar as calibrating a UV-Vis spectrophotometer with holmium oxide or a mass spectrometer with PFTBA.

RTL Offers Many Benefits
RTL, which integrates seamlessly into the HP ChemStation for GC systems, provides the following benefits for customers performing capillary gas chromatography:

Fast and easy transfer of methods — new GC methods typically are developed at one laboratory, then used at multiple sites. It is unusual for the systems to be exactly the same, especially column lengths. Without RTL, users at the remote locations have to modify calibration tables, timed-event tables and integration-event tables manually. With RTL, the method developer locks the method, and users simply run their usual standard to re-lock the methods on the different HP 6890 systems.

Greater confidence in results — Since chromatograms are the same, regardless of instrument configuration or location, results can be compared quickly and easily. The excellent retention-time reproducibility of the HP 6890 GC system with EPC also allows users to set very narrow peak windows, allowing clear differentiation between closely eluting peaks and reducing the possibility of misidentifications.

Increased efficiency — Faster method setup and transfer means more time can be spent running samples, which, in turn, may lead to faster decisions about process and product quality and faster time to market.

Contact: Medtec Products Limited
P O Box 34-241, Birkenhead, Auckland
Phone: (09) 4791068, Fax: (09) 4791450
Email: phermans@medtec.co.nz
Website: http://www.medtec.co.nz
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SIMULTANEOUS SELECTED ION SCANNING AND FULL SCAN MODE WITH THE PE TURBOMASS GC/MS

TurboMass can perform Selected Ion Monitoring (SIM) scanning while also acquiring in the Full Scan mode. The Full Scan mode provides classical spectra that can be library searched for positive identification. In SIM, only the ion of interest is monitored, independently from surrounding interferences and coelutions, providing dramatic increases in sensitivity. The combination of the two scanning modes affords the advantages of both techniques in a single chromatographic run.

A mass spectrometer data acquisition method can be created which combines both Full scan and SIM modes. For example, a method can be created to scan from 45 amu to 450 amu for the entire run. At the same time individual masses can also be selected and scanned for a specified period of time during the same run.

This is done through the "Scan Functions" screen where one function contains the full scan parameters for the entire analytical run. Additional functions can contain selected ion mode scan parameters for specific time intervals during the same chromatographic run.

The SIM peak can then be used for quantification while the Full Scan provides library searchable spectra for accurate identification. Quantitation can be performed using Full Scan Function or SIM on a compound-by-compound basis.

Simultaneous Selected Ion & Full Ion (SIFI) Scanning combines all the benefits from both modes of operation into one chromatographic run. Acquisition of library searchable spectra ensures accurate identification while at the same time the selected ion signal provides enhanced quantifiable sensitivity.

Contact: Peter Hall, Perkin-Elmer Pty Ltd
Free Phone: 0800 776767, Free Fax: 0800 776000
Email: perkin-elmer@clear.net.nz
Internet: http://www.perkin-elmer.com
circle number 25 on the reader reply card

PERKIN-ELMER'S NEW TURBOMASS SYSTEM MORE VERSATILITY FOR ALL YOUR GC/MS NEEDS

Producing accurate compound identification and quantitation in the shortest time possible is crucial to the productivity of any laboratory. But dirty, difficult-to-handle samples, which commonly contaminate the components of other GC/MS systems, can cost precious time for system cleanup, maintenance and repair - not even considering the time required to reproduce lost data. Perkin-Elmer's new TurboMass Mass Spectrometer is the ultimate GC/MS solution, providing maximum throughput, superior accuracy, lower detection limits and improved system stability thanks to an unequaled array of sample handling options - whether you're testing liquids, solids or gases.

The TurboMass GC/MS system is uniquely designed to maintain the highest data integrity and superior throughput capabilities. But that's only the beginning! The TurboMass Mass Spectrometer can be easily configured to meet your needs with a variety of features and options. They include:

The AutoSystem™ XL GC
Our built-in liquid autosampler features an integrated design with a choice of three syringe sizes and three injection speeds. It accommodates any combination of analyses and enhances productivity by allowing easy access to either injection port with a single autosampler.

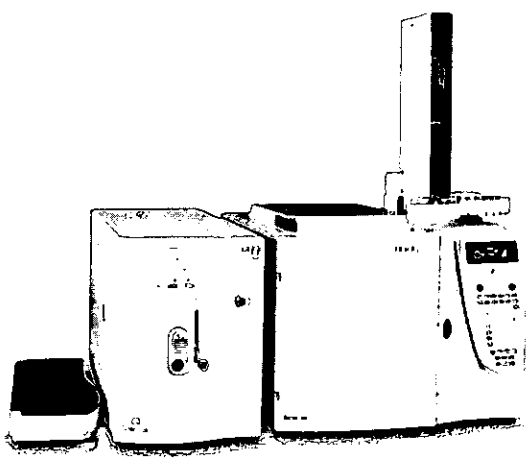
The HS 40XL Headspace Sampler
Pioneered by Perkin-Elmer and refined through 25 years of practical experience, headspace sampling maximises your sample throughput by overlapping the heating times of samples. This unique pressure-balanced, time-based injection technology offers unparalleled chromatographic quality and increased sensitivity.

The ATD 400 Automatic Thermal Desorber
To simplify sample preparation, the ATD 400 uses heat to desorb and extract volatiles from sorbent-filled air sampling tubes or from tubes containing solid or liquid samples. Using two-stage desorption with an electrically-cooled trap to concentrate volatile organics without liquid cryogen, the ATD 400 can handle up to 50 sample tubes while heating at 2400 °C/min to deliver components to the GC/MS in a narrow band for unsurpassed chromatography.

PreVent™ System
Our proprietary PreVent System uses the combined features of the Temperature-Programmable Split/Splitless injector and Programmable Pneumatic Control to increase analytical throughput by removing unwanted components from the GC before they reach the mass spectrometer. So, you can manage difficult samples and protect your column while lowering detection limits.

Contact: Peter Hall, Perkin-Elmer Pty Ltd
Free Phone: 0800 776767, Free Fax: 0800 776000
Email: perkin-elmer@clear.net.nz
Internet: http://www.perkin-elmer.com
circle number 26 on the reader reply card

GC/MS/MS FOR ENVIRONMENTAL APPLICATIONS



Finnigan's GCQ Plus Ion Trap GC/MS/MS system has recently been upgraded with enhanced functionality and improved software.

Now GC/MS/MS is available with an Ion Trap that gives classical library searchable EI spectra and also product ion scan capability in both positive and negative ion modes. This means getting the best of both classical GC/MS analysis with lower detection limits and greater specificity with MS/MS experiments as standard.

All the standard and optional accessories for GC/MS systems are available including Direct Probes via a vacuum interlock. EI, PICI, NICI and MSMS are available with either diffusion pumping or turbomolecular pumps.

The new Xcalibur Software that operates in Windows NT with 32-bit processing improves vastly the functionality and data handling capabilities of the GCQ plus. Coupled with the GCQ Plus is the new Trace 2000 GC from CE Instruments to give the absolute latest in technology for GC capability and performance. The Trace 2000 GC is packed full of new features including the fastest ramping oven today (both heating up and cooling down), electronic automatic leak testing, electronic automatic column characterisation and so much more.

Supporting this are many technical papers that describe in detail the applications performed with the GCQ Plus.

Available are Technical Reports titled:
Analysis of Pesticides by EI-GC/MS;
Analytical Tandem Mass Spectrometry with a Benchtop GC/MS/MS System for the Analysis of Chlorinated Pesticides;
Analysis of Volatile Organic Compounds Under USEPA Method 524.2;
Analysis of Semi-Volatile Organic Compounds Under USEPA Method 525.2;
Automated On-line SPE GC/MS for the Analysis of Pesticides in Drinking Water.

Contact: Stuart Tyler, Alphatech Systems Ltd
P O Box 37-583, Parnell, Auckland
Phone: 09 3770392, Fax: 09 3098514
Email: sales@alhatech.co.nz
circle number 27 on the reader reply card

NEW LITERATURE FROM HP DESCRIBES THE ANALYSIS OF INORGANIC AND ORGANIC ANIONS BY CAPILLARY ZONE ELECTROPHORESIS

Hewlett Packard Company has published an application note (Literature 5965-5744) that describes the development and optimisation of a method for the analysis of inorganic and organic anions. The method involves separation of the anions by capillary zone electrophoresis (CZE) followed by indirect UV absorption detection using 2,6-pyridinedicarboxylic acid as background electrolyte.

The 12-page, black and white application note explains why the selection of both buffer and background electrolyte is critical for successful CZE separation and indirect detection. Optimisation of the method is described in detail showing, for example, the effect of pH on anion mobility and separation. The linearity, reproducibility and sensitivity of the optimised method indicated its suitability for routine analysis of environmental and food samples.

To receive the application note,

Contact: Medtec Products Limited
P O Box 34-241, Birkenhead, Auckland
Phone: (09) 4791068, Fax: (09) 4791450
Email: phermans@medtec.co.nz
Website: http://www.medtec.co.nz
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FAST GC/TOF MS FROM LECO

The LECO Pegasus-2 is an industry breakthrough that combines time-of-flight mass spectrometry with a proprietary fast detection data system. This extremely fast system has an acquisition rate of up to 500 full scan mass spectra per second. It offers at least a 10-fold decrease in analysis time for most applications. Faster acquisition rates allow this instrument to handle the narrow peak widths resulting from fast gas chromatographic separations without a loss in data integrity or system sensitivity. The software is Windows-based and features peak locating algorithms, proprietary deconvolution algorithms, and more.

Contact: LECO Australia Pty Ltd,
Phone: (+61-2) 98945955, Fax: (+61-2) 98945247
circle number 29 on the reader reply card

TURBOMASS MASS SPECTROMETER SPECIFICATIONS

The TurboMass Mass Spectrometer is a benchtop mass spectrometric detector which is interfaced to the AutoSystem XL Gas Chromatograph. The entire system can be set up and run through the TurboMass Mass Spectrometer System Software under Microsoft Windows NT.

Hardware

Analyzer
Quadrupole with prefilter.
131 mm x 12 mm circular rods
16 mm x 12 mm prefilter rods
Mass Range
2 - 1200 Daltons (amu)
Mass Stability
±0.1 m/z mass accuracy over 48 hours
Ionisation Modes
Electron Ionisation (standard)
Positive / Negative Chemical Ionisation (optional)
Electron Ionisation Voltage
10-100 eV
Filament Material
Tungsten
Vacuum Pumps
Choice of:
- 80 L/sec air-cooled diffusion pump
- 250 L/sec air-cooled turbomolecular pump
(optional water cooling)
Field Upgrades
Positive / Negative Chemical Ionisation
Turbomolecular pump
Pump-down Time
~15 min for air/water
< 1 hour for quantitative stability
Detector
Sealed long-life photomultiplier
GC Transfer Line
Direct capillary interface settable from 50 °C to 350 °C. Accepts 0.53 mm i.d. GC columns at flow rates up to 5 mL/min.
Ion Volume Temperature
120 °C to 350 °C
Calibrant Gas
PFTBA (FC-43) or user selectable

Performance

Scan Rate
Fully variable up to 6000 Da/sec
Maximum Full Scan Acquisition Rate
5 scans/sec over 50-650 Da
Linear Dynamic Range
Concentration: 105 compound
Electronic: 106 -107 dependent on acquisition rate
Number of Ions in Single Ion Monitoring Mode
32 sets of 32 ions

Sensitivity

EI Full Scan Detection Limits
1 pg of octafluoronaphthalene at a S/N of 10:1 RMS (2:1 peak-to-peak)
EI SIM Detection Limits
100 fg of octafluoronaphthalene at a S/N of 25:1 RMS (5:1 peak-to-peak)
Positive CI Full Scan Detection Limits
10 pg of benzophenone at a S/N of 10:1 RMS (2:1 peak-to-peak)
Negative CI Full Scan Detection Limits
1 pg octafluoronaphthalene at a S/N of 20:1 RMS (4:1 peak-to-peak)

Optional Libraries and Software

NIST Mass Spectral Library
NIST Chemical Structures Database
Wiley Library
Pfleger / Maürer / Weber Library
Aquarius Environmental Reporting Software

Physical

Power
120V ± 10%, 15 amps, 50/60 Hz
220V + 16%, -10%, 7.5 amps, 50/60 Hz
Operating Temperature
10 °C to 35 °C
Relative Humidity
20-80%, non-condensing
Width
30 cm (12 in.)
Depth
64 cm (25 in.)
Height
41 cm (16.25 in.)
Weight:
45 kg (100 lb)

Contact: Peter Hall, Perkin-Elmer Pty Ltd
Free Phone: 0800 776767, Free Fax: 0800 776000
Email: perkin-elmer@clear.net.nz
Internet: http://www.perkin-elmer.com
circle number 30 on the reader reply card

HP INTRODUCES NEW HP 5973 MSD SYSTEM FOR HIGHLY SENSITIVE EI, PCI AND NCI ANALYSES

Hewlett-Packard Company have introduced the HP 5973 MSD system for electron ionisation (EI), positive chemical ionisation (PCI) and negative chemical ionisation (NCI) analyses. Designed for detecting and measuring trace level compounds in complex matrices, the enhanced system offers unsurpassed sensitivity and ease of use. Existing turbopump HP 5973 MSD systems can be retrofitted for PCI and NCI analyses.

Sensitivity
In the EI and PCI full scan modes, the system provides low-picogram-level sensitivity. In the NCI mode, it provides sensitivities that are up to 1,000 times greater (low-femtogram level sensitivity).

Simplicity of Operation
A simple graphical user interface makes it easy to switch between the PCI and NCI modes, and automated tuning allows easy setup of PCI and NCI analyses. Direct access to the ion source simplifies maintenance.

Chemical Ionisation
Chemical ionisation is a gentle technique in that it keeps most of a sample's molecules intact. PCI mode can give positive proof of a molecular ion — and therefore determine a molecular weight — through the use of adduct ions. PCI mode also can determine molecular weights for compounds that may not be identified in EI mode.

Negative Chemical Ionisation
NCI is useful for quantifying targeted, known compounds at extremely low concentrations. It also provides the selectivity needed to quantitate compounds in such complex sample matrices as foods and biological samples. The NCI mode is primarily applicable to compounds that can capture thermal electrons. However, through derivatisation, many compounds can be made amenable to electron capture — substantially increasing the number of compounds that can be analysed using this highly sensitive technique.

Information about HP chemical analysis products and services can be found on the World Wide Web at http://www.hp.com/go/chem

Contact: Medtec Products Limited
P O Box 34-241, Birkenhead, Auckland
Phone: (09) 4791068, Fax: (09) 4791450
Email: phermans@medtec.co.nz
Website: http://www.medtec.co.nz
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ADVANCES IN GC SEPTA FROM RESTEK

Two new products from Restek are specifically designed to control the two major drawbacks of injector septa, septa bleed and life span. Merlin Microseal is the long life alternative and Ice Blue is for the low bleed applications. A commercial laboratory that runs four different brands of gas chromatograph and a GC/MS tested both these products extensively.

After 10 months the Merlin Microseal with 1000's of injections on a HP 7673 still looked and performed like new.

Routine maintenance involved weekly checks with a Restek leak checker. Increased carrier gas leakage was a signal for the Merlin to be disassembled, cleaned, dried and reassembled. The comment was it was hard to wear the Microseal septa out if it was installed and checked regularly.

As for chromatographic performance the user noticed no septum bleed and no septum particles shedding into the liner. This enabled the use of laminar cup liners that improve vapourisation but are less tolerant of shedding of particulates from septa.

IceBlue Septa showed no sign of bleed even at 300 °C. Manual injections were smooth with low needle resistance. Resealing was excellent even after 300 injections. The real surprises came when replacing the used septa with a new one. The used septa

did not stick to the injector port and no oily film was detected as with many other septa. As an added bonus no particulates were found so use of more complex liners is possible.

Contact: Stuart Tyler, Alphatech Systems Ltd
P O Box 37-583, Parnell, Auckland
Phone: 09 3770392, Fax: 09 3098514
Email: sales@alhatech.co.nz
circle number 32 on the reader reply card

HP PUBLICATION DESCRIBES THE BENEFITS OF FAST GAS CHROMATOGRAPHY USING THE HP 6890 SERIES GC SYSTEM

Hewlett-Packard Company has published a brochure brief (Literature 5966-0435E) titled "High Quality GC Results, Fast. It's Time."

The publication outlines the benefits of performing fast gas chromatography (GC). It also describes how the HP 6890 Series GC system has everything needed to reduce analysis times by as much as tenfold. The brochure brief includes information on how the HP method-translation software, available free on HP's Chemical Analysis Website, can be used to convert existing GC methods to fast GC methods quickly, easily and predictably.

Chromatograms are included that demonstrate real examples of how the HP 6890 Series GC system was used to slash run times while maintaining the same elution order as the original method. A table highlights the standard features of the HP 6890 system — many of them exclusive to HP — that facilitate fast GC.

Information about HP chemical analysis products and services can be found on the World Wide Web at http://www.hp.com/go/chem.

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P O Box 34-241, Birkenhead, Auckland
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Email: phermans@medtec.co.nz
Website: http://www.medtec.co.nz
circle number 33 on the reader reply card

RESTEK'S LOW BLEED MS COLUMNS FOR CAPILLARY GCMS APPLICATIONS

Restek has recently developed new chemistry that allows them to manufacture even better low bleed MS phases than previously available.

Conventional capillary GC columns use liquid stationary phases, many are crossbonded for operation at higher temperatures. Even with crossbonding the liquid stationary phase will slowly elute to be seen as column bleed. This is especially a problem with high temperature applications using highly sensitive detectors such as mass spectral detectors.

The level of column bleed effects the sensitivity of any GC/MS especially ion traps using automatic gain control. As the level of column bleed increases, so does the signal from bleed ions in the mass spectra of analytes and unknowns and the sensitivity severely degrades. The contribution of bleed ions to the mass spectra can result in misidentification of compounds, requiring laboratory personnel to subtract these ions prior to library searching. Finally because bleed ions contribute to the signal of the quantitation mass, quantitation of analytes and unknowns will be miscalculated. So for these reasons it is critical that analysts select the lowest bleed columns available for GC/MS applications.

Restek has recently developed new chemistry that enables true low bleed MS phases exhibiting much lower column bleed than before. In addition to the existing RTX-5MS column Restek now have a range of low bleed MS columns specifically for GC/MS applications. Even Trifluoropropylmethyl polysiloxane RTX-200MS exhibits low bleed at 300 °C. This gives the widest range of stationary phases to choose from while guaranteeing low bleed.

In addition to Restek's new chemistry a rigorous QA testing includes MS polymer batch testing and individual column testing for inertness, efficiency and bleed using a special mix designed for environmental analysis. This ensures each MS column exceeds the requirements of the most sensitive mass spectrometers.

Contact: Stuart Tyler, Alphatech Systems Ltd
P O Box 37-583, Parnell, Auckland
Phone: 09 3770392, Fax: 09 3098514
Email: sales@alhatech.co.nz
circle number 34 on the reader reply card

Book Reviews

The Chemistry of Mind-Altering Drugs. History, Pharmacology, and Cultural Context

Daniel M Perrine, Amercian Chemical Society, Washington, DC, USA. ISBN 0-8412-3253-9. 1996

In the preface the author states "Of the more than 10 million chemical substances identified by *Chemical Abstracts*, this book is concerned with the tiny fraction, at most a few hundred, that have the astonishing capability of affecting human consciousness". A scene-setter indeed! In the ensuing chapters Daniel Perrine develops this theme in an absorbing account of both the scientific and societal aspects of usage of (mainly) illicit drugs in today's world.

The book is written with readership by the non-specialist scientist/chemist clearly in view. At the same time there is sufficient presentation of molecular structures to satisfy those readers having a knowledge of organic chemistry to about first-year university level. However, not content with discussing the material only in the contexts referred to in the title, Perrine takes the opportunity also to attach a Trojan Horse of fundamental organic chemistry, in four appendices entitled "HONC: The Four Key Elements", "Return to the Second Dimension", "How Shall I Bond Thee? Let Me Count the Ways", and "Through the Looking Glass". To those readers who retain a less-than-positive memory of the joys of fundamental organic chemistry, these chapter headings offer a delightful insight into the easy-reading style and presentation employed by Perrine throughout the book.

To return to the main theme, the first chapter "Mind and Molecule: Neurotransmission in Context" provides a synopsis of the pharmacology and neurochemistry of drug transmission in the human mind. This chapter is sufficient to enable the reader to become familiar with current views of the biological networks involved in drug responses *in vivo*. The following six chapters are entitled "Opium and the Opioids"; Depressants: Alcohol, Benzodiazepines, Barbiturates"; Stimulants: Nicotine, Caffeine, Cocaine, Amphetamines; "Antipsychotics and Antidepressants"; "Psychedelics: LSD to XTC"; "Dissociatives and Cannabinoids: PCP, THC, ETCs". In each of these chapters there is an admirable juxtaposition of apposite and often quirky historical snippets, of chemical structures, of structure-activity relationships, of organic synthesis sequences, and of established pharmacological responses. The organisation of the discussion within each class of compound follows a clear structure-based pattern which allows the reader to appreciate how the threads of structure-activity relationships are deduced in the laboratory, and then knitted into new (and hopefully "improved") drugs. The sociological aspects of drug abuse are interwoven with the chemistry/pharmacology, and are presented in a non-judgemental manner. As befits a book bearing the aegis of the ACS, each chapter concludes with a set of references and notes.

This is an excellent account of an area of science and society which is often viewed at arms length by the scientific establishment. There is no doubt, however, that the inappropriate use of pharmaceutical drugs, together with the growth of the associated street culture, offers a direct challenge to the definition of appropriate societal response. In this excellent book Daniel Perrine intertwines the factual chemistry of mind-altering drugs with a necessarily more diffuse commentary about consequential social behaviour. His style is up beat, informative, and always highly readable. He succeeds admirably in targeting his intended audience of both chemists and science-conscious laypersons alike.

Paul D Woodgate
Department of Chemistry, University of Auckland.

Chemical Processes in New Zealand - Second Edition, Volumes 1 and 2, 1998

Edited by John E Packer, John Robertson and Heather Wansbrough

A New Zealand Institute of Chemistry Educational Publication

It is my great pleasure to review the second edition of Volumes 1 and 2 of "Chemical Processes in New Zealand" This second edition of two volumes follows on from two highly successful earlier volumes, the first of which appeared in February 1978, with the second volume (covering topics not previously dealt with in Volume 1) appearing 10 years later in February 1988.

The two volumes provide an excellent, general summary of the chemistry involved in a wide range of industries in New Zealand. Volume 1 deals with Chemicals, Chemicals and Soils, The Dairy Industry, The Forestry Industry, Animal and Fish Products, Food and Beverages, and Energy. Volume II deals with Metals, Inorganic Materials, Polymers and Surface Coatings, Detergents and Cosmetics, Biotechnology and Pharmaceuticals, Water, Environment, Analysis and Measurement, and People in Chemistry. These articles were written by over a hundred contributors spanning industry and academe in New Zealand. Included in the present edition is a copy of an NZIC publication appearing in 1940, called "Chemistry in the Development of New Zealand Industry" which serves to give a historical perspective on the level of New Zealand Industry in that era. By browsing through the present set of volumes, comparison can be made with the large range of industries existing in New Zealand today showing how we have progressed over the past sixty years and the diversity and scale of the Chemistry actually involved in the industrial processes described.

The two volumes of the second edition clearly serve as a very valuable teaching resource for secondary schools as was their original purpose. However, it is clear upon browsing through the well written, researched and illustrated sections of the present edition that these can serve a far wider audience such as staff at tertiary institutions, chemistry undergraduates, postgraduate research students as well as chemistry professionals working in industry. This fact was acknowledged in the preface to Volume 2 of the first edition of Chemical Processes in New Zealand.

Articles contained in each section are well set out and begin with a grey summary box which offers a good precis of the subject in question. The rest of any given article is systematically laid out

and written in a clear, concise and user-friendly style so allowing assimilation by a broad audience of people with differing perceptions and knowledge of chemistry. I especially found the articles on the Chemistry in the Dairy Industry of valuable reading given my research interests in this area. In fact, one of my research students upon seeing the volumes, immediately placed an order for the books. The second edition, moreover, covers a number of new areas which have become important in modern New Zealand industry in the last decade, such as aspects of Biotechnology (e.g. DNA profiling in forensic science, Biocatalysis, and testing for various drugs), Technology and Environmental issues (e.g. Air Pollution Monitoring, Monitoring the Working Environment etc).

Due to time constraints in its preparation, the volumes do not contain complete cross referencing page numbering, or a compiled index. However, this is a minor issue considering the well-organised and relatively typo-free work that has resulted. At the end of each article, the contributors are clearly listed so that people keen to seek further information know who to make enquiries to. The absence of page numbering is counteracted by the inclusion of the title and page number of each individual article as a footnote in the bottom right hand corner of each page which allows for easy thumbing through to find the desired article. The volumes in the second edition are also conveniently available unbound for a slightly cheaper price. This facilitates its use as a teaching resource for secondary school educators who wish to copy the material for students.

Overall, I feel this updated version of Chemical Processes in New Zealand to be a thoroughly interesting piece of work which offers hours of stimulating reading. The generality and breadth of much of the Chemistry also means that this work could be sold overseas and still offer an excellent teaching and/or information source for Chemists and non-Chemists alike. At less than 81 dollars for the two volumes, the work is real value for money. It is rare to find such a comprehensive text dealing with such numerous aspects of chemistry that sells for so little.

Dr Michael R Mucalo
Department of Chemistry, University of Waikato

EPA METHOD 8260 by GC/MS

Michael J Burke and Elaine A LeMoine
The Perkin-Elmer Corporation, 761 Main Avenue, Norwalk, CT 06859-0010 USA

US EPA Method 8260[1] is a Gas Chromatographic/Mass Spectrometric (GC/MS) method for the determination of volatile organic compounds in a variety of sample matrices, including ground water, sludges, waste solvents, oily wastes, soils, and sediments, to name just a few.

Method 8260 can be used to quantitate most volatile organic compounds that have boiling points below 200 °C and that are insoluble or slightly soluble in water, as well as some volatile water-soluble compounds. However, quantitation limits can vary with compound solubility.

This brief outlines the performance of Method 8260 on a new mass spectrometer, the Perkin-Elmer TurboMass™ GC/MS. Tuning, calibration, and the chromatographic conditions are developed and presented here.

Summary of Method

Sample aliquots are introduced into the gas chromatograph using a purge-and-trap method, headspace method or by direct injection. Extracted analytes are desorbed or injected directly onto a large-bore capillary or cryofocussed on a capillary precolumn before being flash evaporated to a narrow-bore capillary for analysis. The column is temperature programmed to separate the analytes for detection using a mass spectrometer (MS) interfaced to the gas chromatograph. Target analyte identification is accomplished by comparing the mass spectra with the electron impact spectra of authentic standards. Quantitation is accomplished by comparing the response of a major (quantitation) ion relative to an internal standard with a five-point calibration curve.

Instrumental Operating Conditions

The instruments and recommended chromatographic conditions are listed in Table 1. The purge-and-trap transfer line is attached to the injector using a modified HS 40 Automatic Headspace Sampler union. Carrier gas is supplied using a pneumatic pressure control (PPC™) module for full PPC functionality.

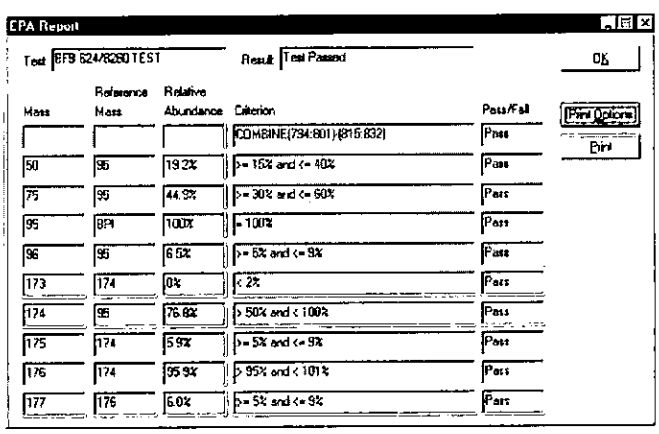
Table I. Instrumental Operating Conditions

Detector	**TurboMass™ Quadrupole Mass Spectrometer**
Mass Range	45 – 400 amu
Gas Chromatograph	**Perkin-Elmer AutoSystem™ XL GC**
Column	PE Volatiles 60 m x 0.25 mm x 1.0 µm
Initial Temperature	45 °C for 8 min
Ramp 1	6 °C/min to 200 °C
Carrier Gas	He
Pneumatic Pressure Control (PPC)	Flow Mode 1.5 mL/min
Split	20 mL/min
Injector	PSS (Programmable Split/Splitless)
Injector Temperature	200 °C
Purge-and-Trap Sampler	**Tekmar™ 3000**
Purge Gas Flow Rate	40 mL/min
Purge Time	11 min
Purge Temperature	Ambient
Desorb Temperature	180 °C
Desorb Time	4 min
Bake Temperature	225 °C
Bake Time	4 min
Trap	VOCARB 3000

Tuning Criteria

Every GC/MS system must be hardware-tuned to meet the criteria shown in Figure 1 using a 5–50 ng injection or sample sparge of 4-bromofluorobenzene (BFB). This calibration verification must be demonstrated every 12 hours of analysis time to verify system stability and performance.

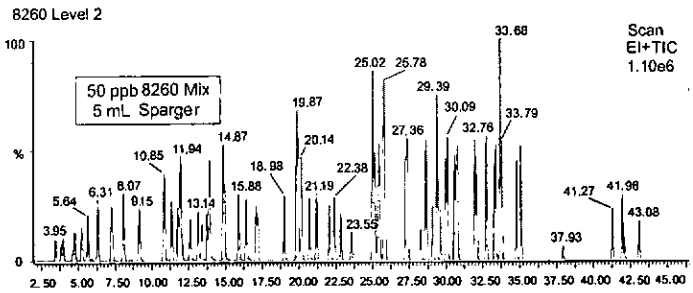
Figure 1. BFB Tune Results.



Calibration standards

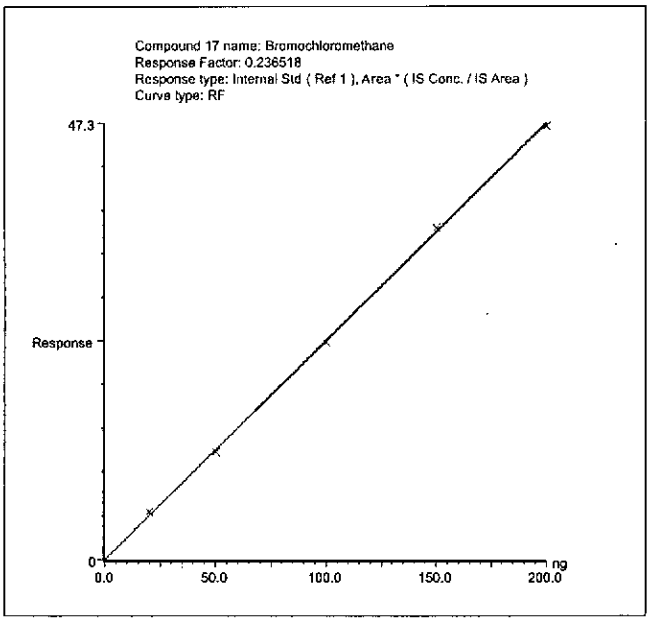
A minimum of five concentration calibration standards are prepared and analysed using analytical conditions identical to those used for samples. One of the concentrations should be at a concentration near, but above, the method detection limit. The remaining concentrations should bracket the expected real sample concentration range, but must not exceed the working range of the GC/MS system. All standards must contain each analyte targeted for detection by this method. A typical chromatogram is illustrated in Figure 2.

Figure 2. Volatile Organic Standards at 50 ppb.



The calibration curve shown in Figure 3 is that of bromochloromethane. Five incremental concentration standards are analysed covering the method recommended range of 20 ppb to 200 ppb. All standards and samples contain internal standards and surrogates at a midpoint concentration. In this case the internal standards and surrogates were spiked at 50 ppb each. After the initial calibration is successfully completed, a continuing calibration verification must be demonstrated once for every 12 hour analytical shift using a mid-range standard.

Figure 3. Calibration results for bromochloromethane.



Performance

Characteristic ions are used to calculate the area response against the concentration for each compound and each internal standard. Response factors (RF) are calculated for each compound relative to the nearest internal standard. The RF is calculated as follows:

$RF = (A_{(x)}C_{(is)})/(A_{(is)}C_{(x)})$

where:

$A_{(x)}$ = Area of the characteristic ion for the compound being measured

$A_{(is)}$ = Area of the characteristic ion for the specific internal standard

$C_{(is)}$ = Concentration of the specific internal standard

$C_{(x)}$ = Concentration of the compound being measured

These Relative Response Factors (RRF) are used to calculate the average RRF for every compound. The percent relative standard deviation (%RSD) is calculated using the average RRFs from the initial calibration. In order to evaluate the integrity of the calibration, the %RSD for each compound should be less than 15. However, the %RSD for each individual Calibration Check Compound (CCC) must be less than 30%. The CCCs are 1,1-Dichloroethene, Chloroform, 1,2-Dichloropropane, Toluene, Ethylbenzene, and Vinyl chloride and the %RSD results are listed in Table 2. In all cases the %RSD was compliant with the mandatory and recommended method guidelines.

Surrogate standards are evaluated for accuracy and precision relative to suitable recovery levels. Table 3 lists the % recovery and %RSD results of the surrogate compounds. Recovery limits for spiked water samples are also listed.

Conclusion

The accurate determination of volatile organic compounds in soil and water is important for environmental assessment and monitoring. The analysis can be challenging and requires a rugged method for the most productive results. The information presented here highlights some of the more critical criteria for method validation using the TurboMass GC/MS. The tuning, calibration, and relative response factors are compliant with the EPA method requirements.

References

(1) Test Methods for Evaluating Solid Waste; US Environmental Protection Agency, National Technical Information Service: Washington, DC, Rev. 2, Vol. 1B. (1996).

Table 2. Initial Calibration Performance Check

	Relative Response Factors							
Calibration Check Compounds	20 ppb STD	50 ppb STD	100 ppb STD	150 ppb STD	200 ppb STD	Avg RRF	Std. Dev.	%RSD
Ethylbenzene	0.980	1.009	0.925	0.870	0.871	0.931	0.063	**6.76**
Toluene	0.933	1.069	0.959	0.876	0.859	0.939	0.083	**8.88**
1,2-Dichloropropane	0.521	0.578	0.580	0.599	0.596	0.575	0.031	**5.46**
Chloroform	0.723	0.761	0.724	0.713	0.712	0.727	0.020	**2.75**
Vinyl chloride	0.464	0.414	0.390	0.369	0.314	0.390	0.055	**14.20**
1,1-Dichloroethene	0.172	0.173	0.203	0.214	0.210	0.194	0.020	**10.51**

Table 3. Method Accuracy and Precision by Mean Percent Recovery and Percent Relative Standard Deviation

Surrogate	Run1	Run 2	Run 3	Run 4	Run 5	Run 6	AVG	%RSD	Recovery Limits
Dibromofluoromethane	89.28	112.09	94.10	99.19	103.50	101.84	100.00	7.90	86–118
Toluene D8	92.68	102.61	99.37	100.41	101.83	103.11	100.00	3.85	88–110
Bromofluorobenzene	90.98	97.32	99.49	102.24	103.39	106.59	100.00	5.45	86–115

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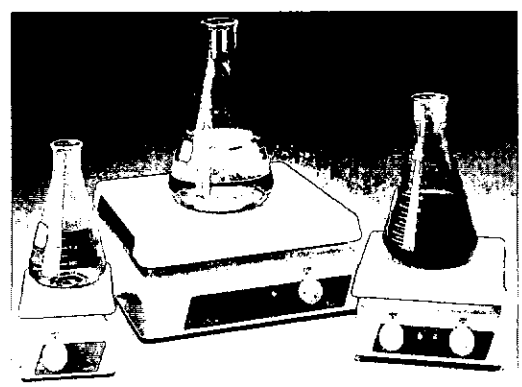

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Failure To Act Is A Breach Of The Act

Peter W Harland, Chair of the University Health and Safety Committee, University of Canterbury
Private Bag 4800 Christchurch, Email: P.Harland@chem.canterbury.ac.nz

Introduction

The Health and Safety in Employment Act (the Act) covers all places of work in New Zealand except for the Defence Forces and the crews of planes and ships. Over a relatively short period most of the New Zealand work force has been introduced to the Act through publicity, training and newly formed workplace safety committees. Despite the undeniable benefits of the Act for everyone covered by its provisions, a degree of apprehension and misunderstanding among secondary and tertiary science/ engineering teachers persists. Much of this probably arises from the jargon used in relation to the legislation and to the publicity given in the media to successful prosecutions under the Act and to the increasing level of fines imposed over the past few years. "Accidents" involving serious injury or harm may well result in an official investigation by the Occupational Safety and Health Service (OSH) and a prosecution inherently implies a guilty party since compliance with the Act would preclude such accidents. In other words, if a serious incident/accident occurs, someone is to blame. An accident is defined in the dictionary as a blameless event, although truly blameless accidents are called acts of God, so God is to blame. The definition of accident in the legislation is subtly different, "Accident means an event that, (a) Causes any person to be harmed; or (b) In different circumstances, might have caused any person to be harmed". In addition, the association of terms such as incompetent and irresponsible with breaches of the Act tend to worry professional people who value their reputations above most else. School teachers and tertiary sector teachers may also be worried that their reputation as professionals may depend on the actions (or inactions) of their charges. Despite these concerns, which are legitimate to some extent, I hope this article will serve to clarify our obligations and responsibilities under the Act, identify those features of the Act which are of greatest benefit and explain how to minimise concern through the pain-free management of health and safety.

Question time at the forums that I have attended and organised to address health and safety management have been dominated by "what if ..." questions. There are so many "what if ..." questions that an entire book could be devoted to real and hypothetical situations. I will cover a few of the questions most often posed by teachers and lecturers following a synopsis of the Act with recommendations for the establishment of the management functions required in order to maintain compliance in schools and the tertiary sector.

The Act is administered by the Department of Labour through the OSH. OSH maintains offices in all the main centres; they offer advice and expertise in setting up a framework for managing health and safety through inspectors who are also responsible for on-site inspections, investigations and prosecutions under the Act. The Act emphasises risk assessment and risk management in the workplace, information transfer and the development of a health and safety culture which can be self-managed. These are clearly positive features of the Act. The perceived negative side is that of enforcement; almost half of the Act stipulates the functions and powers of the inspectorate. To be fair, no legislation would work equitably in the absence of an independent authority charged with the responsibility for taking disciplinary measures in cases of non-compliance.

The Health and Safety in Employment Act 1992 was introduced on the 1st April 1993. Previously, health and safety in the workplace was regulated through a myriad of old Acts, Regulations and Codes of Practice. Schools and the tertiary education sector were exempted from much of this legislation and the day-to-day management of health and safety was not high on the agenda for teachers or lecturers. Accidents occasionally happened and the unfortunate casualties were dispatched to GPs, Accident and Emergency facilities or Student Health (where they exist). The Health and Safety Committee at the University of Canterbury (UOC), for example, met once a term to discuss health and safety matters and organised an annual Safety Week for Staff which chiefly interested non-academic staff in practice. The Committee discussed any accidents drawn to their attention since the previous meeting and, when appropriate, new rules and guidelines were drawn up and the University community was kept informed through the UOC staff publication. The management of health and safety by reaction to events as they unfold is no longer an option. The Act imposes legal liabilities, responsibilities and accountability on employers for the health and safety of employees at work. The Act requires that adequate resources be provided in order to maintain compliance with the Act and that employees be consulted on the implementation of the Act. Employers are also required to keep employees fully informed on health and safety matters in the workplace and to take their advice on health and safety issues. This cannot be bad. Employees are the beneficiaries; employers are forced to think past profits and productivity to the welfare of employees, and ultimately the long-term security of employees families and dependants. The Act does not exclude employees from responsibility for their own safety and the safety of others at work; every employer and employee must have a practical appreciation of the Act, failure to do so is a breach of the Act. We cannot complain about draconian rules and regulations, the United States has worked with more stringent legislation since World War II, Europe has coped with equivalent regulations for decades and Australia introduced health and safety legislation based on the British Act in the mid-1980s. The New Zealand Act is a diluted version of the British legislation without the rash of additional amendments imposed on many European nations over the past decade of so through the EEC.

The principal objective of the Act is to provide for the protection of employees from harm at work through: i) the promotion of excellence in health and safety management by employers; ii) penalties for failure to comply; iii) a provision for the appending of regulations and codes of practice to the Act. The employer is defined in the Act as, "the person who or that employs any other person to do work for hire or reward". This translates to the

Vice-Chancellor at a University, the Principal at a Teacher's Training College, the Director of a Polytechnic or the Board of Trustees for a school. These are the people who carry the legal liability for health and safety under the Act. The liability cannot be delegated although responsibility for implementing the provisions of the Act can be shared and we all shoulder responsibility and ultimately accountability and some degree of liability for our actions. The successful management of health and safety depends on knowledge and enthusiasm from the top; probably more so than for any other management function. If those in positions of responsibility denigrate health and safety provisions then a successful programme to maintain compliance with the Act could not function properly and employees would ultimately suffer the consequences. Employees are defined as "a person employed by any other person to do any work for hire or reward". This includes graduate students who are paid part time for marking or demonstrating undergraduate laboratory classes. Although students and undergraduates are not employees, the Act requires that, "employers take all practicable steps to ensure that no action or inaction of any employee while at work harms any other person:. Under the Act, employees, such as teachers and lecturers, assume direct responsibility for the safety of students. However, students who are not employees do not share the same level of accountability as an employee.

The definition and interpretation of the word practicable in terms of the work environment is central to the proper interpretation of intent in the Act. According to the dictionary, practicable means able to be done, feasible, capable of being put into practice. According to the Act, practicable steps begin with elimination, if that is not practicable then the next step is isolation and if that is not practicable the final step is minimisation. However, the onus is on the employer/employee to demonstrate that these steps have been taken where a hazard or a risk has been identified. The Act requires the identification of all risks and hazards; failure to identify a workplace hazard may expose the employer/employee to a charge of negligence or incompetence in the event of a serious accident.

The general duties of employers to employees are summarised in the following statement. Employers must take all practicable steps to a) ensure the safety of employees at work through the provision of facilities for and maintenance of a safe and healthy working environment and b) the development of procedures for dealing with emergencies. In order to fulfil these requirements employers must establish and maintain a health and safety management framework incorporating the following major functions:

i) a health and safety policy, a management structure and procedures;
ii) mechanisms to involve employees;
iii) staff training programmes, records and manuals;
iv) procedures for recording and investigating accidents and incidents;
v) systems to identify and control hazards (including monitoring and reporting);
vi) regular objective inspections and auditing of processes;
vii) emergency procedures;
viii) occupational health and education services.

A discussion of these requirements in further detail using the University of Canterbury as a model will serve to illustrate the responsibilities placed on an educational institution and its employer/employees by this Act.

i) *A health and safety policy, a management structure and procedures*

The Act clearly lays liability for health and safety with the employer. In the case of a facility such as the University of Canterbury with over a thousand employees and over ten thousand undergraduates, the Vice-Chancellor cannot personally devote the time required to run an effective health and safety programme. Professional health and safety personnel are required in order to develop procedures and to take the day-to-day responsibility for the management of an effective health and safety programme. Documentation is crucial. First, a Policy Statement. Second, a management structure or flow chart showing the lines of communication and levels of responsibility with the employer at the top. Third, conditions of employment for each job description detailing specific health and safety responsibilities and immediate lines of communication. Fourth, a compendium of all documents should be put together which includes policies, procedures, codes of practice and any special instructions relating to specific processes developed to fulfil the requirements of the Act. This information must be freely available to all employees.

ii) *Mechanisms to involve employees*

The Act requires that all employees be afforded the opportunity to participate in the health and safety programme through the workplace safety committees. The management of health and safety at the University of Canterbury is the responsibility of the University Safety Officer working with the University Health and Safety Committee chaired by an academic appointed by the Vice-Chancellor. The composition of the committee reflects the diverse nature of activities on campus and the requirement for information transfer and consultation. The University Safety Officer represents non-academic staff and provides the link with external services such as OSH and the Emergency Services; the Deans of Faculties facilitate the rapid dissemination of information to academic staff throughout the campus; representatives from science and engineering bring special expertise; the Director of Student Health and the University Engineer represent important service functions; and the President of the Students Association represents student interests. The Chair of the committee reports to the Vice-Chancellor, Safety Committees in each academic and non-academic department (chaired by the Departmental Safety Officer or the Head of Department) report to the Committee through the University Safety Officer. In addition, there are two important sub-committees that report to the Health and Safety Committee; the Biosafety and Hazardous Materials Committee, which also has an investigative role, and the Electrical Safety Committee. In a school situation, responsibility for the management of hazardous materials and for maintaining compliance with the Electrical Safety Act could be vested with individuals, providing they have the relevant expertise. In effect, every employee has direct access to the employer through representatives on a workplace committee.

iii) *Staff training programmes, records and manuals*

Staff training and education are important features of the Act. In fact, the organisation and implementation of staff training programmes can be a major component of health and safety management in a large organisation. The history of successful prosecutions under the Act has shown that it is not sufficient to

provide a one-off training session on anything; training must be reinforced and repeated at regular intervals, otherwise it is deemed to be out-of-date. Training sessions involving in-house and private providers at the University of Canterbury include the following subject areas: implementation of the Act; occupational overuse syndrome (OOS); electrical safety; emergency first aid; fire safety and use of extinguishers; and safe building evacuation. Electrical safety and emergency first aid certificates are now valid for only two years, OOS training runs almost continuously since it is the main contributor to the accident registers at the University of Canterbury, trial building evacuations are carried out twice a year for each building, and the turnover in staff and changes in regulations necessitate continuous retraining for all sorts of processes. It is important to maintain a register of staff training for inspection by OSH and for the rescheduling of retraining. The University of Canterbury identifies trained first-aiders with an asterisk by their name in the phone book and in the Departmental Safety Manuals. Every school and every Department or group of Departments at tertiary level should prepare and maintain a Safety Manual which is distributed to all employees. The Safety Manual should include a list of the individuals active in the management of health and safety, the people to contact in the case of various problems and emergencies, and the safety rules and practices for the Department.

iv) *Procedures for recording and investigating accidents and incidents*

The Act requires that a register of accidents and incidents be maintained and that accidents in the serious harm category be reported to OSH. An accident requiring 24 hours in hospital and conditions such as serious OOS are notifiable under the Act. OSH can provide a basic model of a form for employees to report accidents and incidents in the desired format. The University of Canterbury also provides a form for the Self-Reporting of Discomfort and Pain. This might include conditions such as OOS, which develops over the longer term. The University of Canterbury provides an occupational health service for employees with a specialist physician on campus for a half day each week and access to off-campus treatment, such as physiotherapy, when recommended by the specialist. The accident register is a part of a stick-and-carrot mechanism which links the employer's ACC levy directly to safety management performance through the accident rate. This provides an incentive for the employer to maintain a safe working environment; there have been heavy fines on companies found to be guilty of falsifying their accident reports. When the Act was first introduced there was some resistance against training sessions by the non-scientists/engineers at the University of Canterbury because they presumed that the hazardous areas were restricted to the science and engineering facilities. In fact, over the past five years the accident register has been dominated by cases of OOS associated largely with the long term use of word processors in all faculties. There is no doubt that disciplines such as Chemistry and Mechanical Engineering present a far higher risk for "accidents" than English or History and this has been recognised at the University of Canterbury through the provision of specialised training on the Act to science and engineering staff.

v) *Systems to identify and control hazards (including monitoring and reporting)*

The Act requires the establishment of procedures for the systematic and regular identification, documentation and risk assessment of existing and new hazards to employees and students and to implement mechanisms for action (all practicable steps) to be taken where necessary. This requirement imposes the most significant on-going commitment on lecturers and teachers. This procedure should be repeated at regular intervals. After consultation with OSH and regard to the literature I believe that a major revision of risks exercise every year with one or two top-up reviews in between would satisfy the requirements of the legislation. At the University of Canterbury, the annual Hazard and Risk Assessment Forms are filed with the University Safety Officer who sends a list of high-risk hazards to the Biosafety and Hazardous Materials Committee for investigation. A Risk Assessment Code (RAC) in the range 1 to 20 is assigned to each identified hazard by the individual involved in the exercise using the following standard table.

Hazard Severity

Probable Frequency	RAC	4	3	2	1
	5	20	15	10	5
	4	16	12	8	4
	3	12	9	6	3
	2	8	6	4	2
	1	4	3	2	1

Hazard severity is an assessment of the expected degree of injury or occupational illness that could result from exposure to the hazard:

1. negligible injuries or illness;
2. first aid or minor medical treatment;
3. permanent partial disability or temporary total disability in excess of 3 months;
4. death or permanent total disability.

Probable frequency is an assessment of the likelihood that exposure to the hazard will result in an accident:

1. remotely possible;
2. known to have happened in the past with similar hazards;
3. strong possibility of happening;
4. has happened previously with this hazard;
5. happens frequently.

RACs in the grey area (8) are considered to represent an unacceptable risk and these are tagged for priority investigation. The identification or recognition of a hazard, which includes activities or processes, requires a fair degree of professional acumen and the exercise cannot be dismissed lightly. For example, a word processor or computer sitting on a staff desk would not seem to present much of a hazard at first glance. However, reference to the University of Canterbury accident register reveals a high frequency of diagnosed cases of low-level and serious OOS which have been directly attributed to the use of these machines. In addition, the "Approved Codes of

Practice for the Safe Use of Visual Display Units in the Place of Work", which are appended to the Act, specify detailed ergonomic constraints on computer work stations which include layout, lighting, work load etc. When all this is taken into account, computer work stations must be assigned a hazard severity rating of at least 2, arguably 3, and a probable frequency rating of 4. This corresponds to a RAC in the range 8 to 12. The Act states that failure to act is a breach of the Act, once a hazard has been identified all practicable steps must be taken to eliminate, isolate or minimise the hazard to users. In practice, this translates into OOS training for all users and the purchase of ergonomically approved furniture (adjustable gas-operated secretarial-type chairs, adjustable footrests, wrist-rests, glare-free VDU screens etc.). Once these actions have been taken the RAC rating decreases below 4. It is worth pointing out that the Act does not expect that all processes can be made risk free; it requires that the risk be minimised (managed) where it can't be eliminated or isolated.

Despite the time that must be invested in this exercise, especially for teaching and research laboratories, I think the benefit to employees is adequately illustrated by this single example. There are additional benefits for graduate students. As professionals with degrees, the hazard identification and assessment exercise for their own laboratories can be delegated to them; providing the research supervisor checks the results and is prepared to accept responsibility. The benefits that result are in terms of a greater appreciation and understanding of their equipment, the physical, chemical and biological properties of substances they use, and the steps which must be taken to make their working environment safer. Under the Hazardous Substances and New Organisms Legislation we are required to fully appreciate and accept responsibility for all substances used. All users must have available a Material Safety Data Sheet (MSDS) on every substance (we post them on the laboratory walls in Stage 1 and issue them to individuals at higher levels). Problems which could arise in a process (experiment) or with the use of substances must be anticipated in advance and procedures put in place to deal with them effectively. Mechanisms must also be in place for the safe disposal of used materials in which the user and handlers accept responsibility for their waste materials.

Where hazards or environmental inadequacies are suspected, such as asbestos, airborne pollutants, animal faeces, inadequate ventilation, poor lighting etc., the Act requires that environmental and/or biological monitoring should be carried out. The Act also requires that the results of any monitoring are made available to the employees. If problems are found, failure to act is a breach of the Act. Since monitoring requires specialised equipment, expertise and time, a firm specialising in this kind of work would normally be engaged. This has turned out to be a spin-off which has benefited some of our past graduates who have either started their own companies or work for international companies specialising in environmental monitoring in accord with the requirements of the Act.

There are many other aspects of the Act that are relevant to the teaching of chemistry in schools and tertiary institutions. For example, the Act states that all steps must be taken to, "ensure that there is provided for, accessible to, and used by the employees suitable clothing and equipment to protect them from any harm that may be caused by or arise out of hazards". The University of Canterbury has attempted to fulfil its obligations to students in undergraduate and research laboratories under this clause by making the wearing of laboratory coats and safety glasses compulsory and providing gloves and ear muffs where necessary. Undergraduate students purchase approved laboratory coats and safety glasses on campus from a supplier appointed by the University. Graduate students and other employees are provided these items free of charge.

iv) *Regular objective inspections and auditing of processes*

The hazard identification and assessment process discussed above is a self-management exercise. It relies on professionalism and honesty. If hazards are missed, ignored because of financial implications, or dismissed because of prejudice (computer work stations can't possibly be a problem), it is the users who will pay the price in injury or lost time and the employer may get the opportunity to learn more about the disciplinary side of the Act. The inspection and auditing provisions in the Act are designed to facilitate objectivity through the involvement of in-house experts, such as the University Safety Officer, and external experts, such as OSH inspectors or companies that specialise in health and safety audits. OSH inspectors have the authority to carry out random inspections, they do not have an audit role although they can ask for the results of audits or require that an audit be conducted. Employers are obliged to address recommendations made by auditors under the Act.

vii) *Emergency procedures*

The Act requires a fully documented set of policies with detailed instructions for employees to deal with emergencies such as building evacuation in case of fire, flood, earthquake, gas leaks, chemical spillage, civil-defence emergencies, and any situations that might arise from the nature of the activities carried out by the business, for example, student unrest, the management of gymnasium facilities, and the operation of a creche for staff. Many of these activities require consultation with authorities such as the emergency services and Civil Defence, experts on the effects of earthquakes, consultants on fire safety etc.

viii) *Occupational health and education services*

The Act charges employers with the responsibility for monitoring the exposure and health of employees in relation to hazards in the work place. This requires occupational health services as well as a training and education programme. The steps taken by the University of Canterbury to provide these services have been covered above.

Who pays for all this?

The management structure and the procedures that must be established and maintained in order to comply with the legislation are expensive in time and resources - who pays? The answer is, the employer pays. Schools and tertiary institutions have to implement the provisions of the Act without targeted funding. The University of Canterbury relies heavily on the full-time University Safety Officer and on the time and commitment devoted by staff on the University Health and Safety Committee, Sub-Committees and the Departmental Committees. In a static budget situation other activities must yield in order to address the provisions of the Act. The provision of a safe working environment is the law. Whether we like it or not, issues such as the provision of new sports equipment,

computers for classrooms or supplementary research funding are not required by law, and failure to deliver does not carry penalties in law.

What if ...

... the attention being given to the legislation fades away? It won't. The introduction of the Act in 1993 has been followed by an avalanche of appended regulations and new Acts which include a revamped version of the Factories and Commercial Premises Regulations and the adoption in New Zealand of the Australian Regulations for Laboratory Practice. If anything, the regulations, and particularly the enforcement side, will tighten up as time goes on. This is a worldwide trend; New Zealand is still in the process of catching up with the standards of safety long accepted in other western nations. What if ...? questions are inherently based in a fear of the personal consequences of falling foul of the Act. The majority of the "what if" scenarios are very unlikely to eventuate if the measures outlined above are put into practice and taken seriously. The following "what if" questions represent a small sample of those put by staff at the University of Canterbury.

What happens if a classroom or laboratory demonstration goes wrong and someone gets hurt?

Before I answer this question it should be emphasised that the Act should in no way be used as an excuse not to carry out demonstrations or to discourage teachers or lecturers from carrying out lecture demonstrations; this is certainly not an intention of the Act. What the Act does, however, is to place responsibility on the teacher and liability on the employer for ensuring that all practicable steps are in place to minimise the risks. The requirements of the legislation are satisfied if a demonstration has been professionally planned and due consideration has been given to undesirable outcomes. If an unforeseen accident/incident does occur and the inspectors are satisfied that the documentation produced (written instructions, forward planning etc. are essential) and the procedures in effect clearly demonstrate that all practicable steps were taken in a professional manner, then a prosecution under the Act is unlikely. In other words, we must think before we act, we must maintain a written account of our procedures and precautions, and we must fully inform the students if there are any remaining risks.

What is the position of a research supervisor if a graduate student suffers a serious accident?

Graduate students are graduates; they are professionals in their field and might be expected to plan and act accordingly. However, as a graduate enrolled for a higher degree they are subject to training and instruction by their research supervisor. In practice, graduate students enjoy a large degree of freedom to make their own decisions and, as they near completion of their degrees, they should be demonstrating initiative in the direction and execution of their research. I do not provide my graduate students with a training manual or with instructions in writing; communication is through discussion and I assume that the students will fine tune and try new ideas as they go. Specialised attention is given to the training and preparation of students in the use of equipment such as high-voltage power supplies, high-vacuum equipment, lasers, lathes etc., and where hazardous materials are being used, checks are made to ensure that the MSDS sheets have been studied and all the necessary precautions have been taken. This constitutes all practicable steps in my opinion. In the event of a serious accident involving a graduate student the supervisor would be required to justify their training methods.

Since there have been no prosecutions in New Zealand involving university research supervisors, the opinions above have not been tested in Court. The legal consequences following a serious laboratory accident involving staff or students will depend on the factors discussed above and possibly some that are unforeseen. For example, a first-year graduate student lost fingers and suffered abdominal injuries in a laboratory explosion at an overseas university. According to the supervisor the student was attempting a deviation from their agreed programme; according to the student the supervisor did not provide adequate training and he had verbally approved the experiment in question. There was nothing in writing. The resulting litigation is still in the Courts. The authorities are prosecuting the Vice-Chancellor as the employer, the Head of Department as the departmental manager and the supervisor as the research manager. The student is taking independent action against the supervisor who has also engaged lawyers to protect his interests. Surely it couldn't happen here!?

What if you see someone else doing something unsafe?

The Act is quite clear on this; if you observe another person about to perform, or performing an operation which you consider to be unsafe or risky then failure to act is a breach of the Act. The full consequences of this requirement in terms of responsibility and liability under the Act may not be immediately apparent. The "woolshed case" involving a South Island farm is often used as an example. A farmer employed itinerant shearers for his sheep flock. On a visit to the woolshed while the shearers were working with electric cutters he was surprised to discover that one of the men had brought his 5 or 6 year old daughter with him and that she was playing around the machinery. He stopped the men working and told the girls father to get his daughter out of the shed before there was an accident, he then left. A short time later the girl managed to get her hand mangled in one of the electric cutters and was rushed to hospital. OSH were informed, an official investigation was carried out followed by a prosecution. Who was prosecuted? The farmer was prosecuted for failure to act; as the employer it was his responsibility to set the rules before the work began and once he recognised a dangerous situation it was his responsibility not just to point out the danger but to act on it by ensuring that the girl was removed from the woolshed. As an employee, the father was also prosecuted for putting his daughter at risk.

Although it does not require a great deal of teaching experience to imagine a chemistry laboratory analogy to the woolshed case, the majority of incidents in this category are more likely to involve a convivial exchange of view with the safest solution emerging. Unfortunately this provision in the Act does have the potential for generating a great deal of friction between staff. I am aware of situations where personal grievances between staff have been channelled into accusations of improper or unprofessional conduct resulting in serious personnel disputes for the Head of Department to resolve. A mechanism for dealing with situations of this nature must be included in the department safety management structure. It is important that all staff know who to contact with problems, suggestions or complaints. The Departmental Safety Officer or the designated equivalent in a school would be the first port of call. If the Safety Officer is unable to provide the necessary expertise or advice then the Head of Department or Principal should be the last port of call.

At the University of Canterbury, a Head of Department can refer sticky situations to the University Safety Officer and the Chair of the University Health and Safety Committee who have access to additional resources and expertise.

Useful References

1. Useful publications available from OSH include:
   A Guide to the Health and Safety in Employment Act;
   How to Identify and Control Hazards;
   Approved Code of Practice for the Management of Substances Hazardous to Health;
   A Practical Guide and Workshop for Completing a MOSHH Assessment;
   A Guide to Managing Health and Safety;
   Health and Safety Management - Systems Assessment;
   Workplace Exposure Standards;
   Approved Code of Practice for the Use of Visual Display Units in the Place of Work;
   Checklist for the Use of Visual Display Units in the Place of Work.

2. Introducing ERMA and Its Role In Implementing the Hazardous Substances and New Organisms Act (HSNO), Environmental Risk Management Authority, Level 3, Ansett House, 69-71 Boulcott Street, P O Box 10924, Wellington, May 1997. (ISBN 0-478-21500-2)

3. A Proposed Methodology for the Consideration of Applications for Hazardous Substances and New Organisms under the HSNO Act 1996, Environmental Risk Management Authority, Level 3, Ansett House, 69-71 Boulcott Street, P O Box 10924, Wellington, August 1997.

4. Proposed Procedures and Information Requirements for the Consideration of Applications for Hazardous Substances and New Organisms under the HSNO Act 1996. Environmental Risk Management Authority, Level 3, Ansett House, 69-71 Boulcott Street, P O Box 10924, Wellington, September 1997.

5. The Occupational Overuse Syndrome - A Compilation of Information for the Patient and Computer User, Dr W E D Turner, 50 Main North Road, Papanui, Christchurch, Telephone (03) 3528598, Facsimile: (03) 3529313.

6. Laboratory Waste Management - A Guidebook, ACS Task Force on Laboratory Waste Management, American Chemical Society, Washington, DC, 1994 (ISBN 0-8412-2849-3).

7. MSDS sheets available on http://www.misc.CORNELL.edu/helpful_data/msds.html

8. Personal Protective Equipment in the High School Chemistry Laboratory: A Policy and Practice Perspective, Peter Forlin, *Aust. J. Chem. Ed.* **42**, May 1995, pages 12-18.

9. Safety and Science - A Guidance Manual for New Zealand Schools, Published by the Ministry of Education, Learning Media Limited, P O Box 3293, Wellington, Editor Sylvia Hill, 1997.

10. Laboratory Fire Exacts Costly Toll, M B Brennan, C&E News, 23 June 1997, pages 29-34.

LETTER TO THE EDITOR

Dear Editor

In the latest *"Chemistry in New Zealand"* you inflicted upon us a Chemical Olympiad question which involves answering which is methylcyclopropane or cyclobutane on the basis of boiling point. My immediate reaction was, unfair! There are too many issues outside the scope of participants. Now, imagine my concern to find in the "answer": "Methylcyclopropane possesses a dipole moment while the dipole moment of cyclobutane is zero. Therefore, the boiling point of methylcyclopropane will be higher than that of cyclobutane".

Now, that is obscure! Particularly since, according to the Handbook of Chemistry and Physics (73rd ed.) cyclobutane has a boiling point of 12 °C and methylcyclopropane 4-5 °C.

It seems the spirits of Aristotle and the opponents of Galileo are alive and well! Dogma Rules! To my mind, this is not particularly better than testing which is the densest by seeing which drops the fastest.

While all this may seem trivial, I see it as somewhat more serious. Rather than focussing on the ability to manipulate spurious theories, would it not be better to try to give the right attitude to science to the young? If we cannot get a scientific attitude to show through in a so-called Olympiad, how do we address the more pressing issues facing society? Who will believe science when we cannot even get this right? And, more to the point, by what right do scientists ask others to believe us?

Yours sincerely

Ian Miller

This letter has been forwarded to those involved in organising the New Zealand Chemical Olympiad team for comment. We hope to publish their comments in a later issue. We publish this letter now to draw comments from our readers - *Ed.*

NEW ZEALAND INSTITUTE OF CHEMISTRY

NZIC COUNCIL NEWS

THE 1999 PRESIDENT

Dr George Clark completed BSc, MSc and PhD degrees in Chemistry at the University of Auckland in 1968, and was awarded the DSc degree in 1985. He was appointed to a lectureship in Chemistry at Auckland in 1970, is now an Associate Professor, and has been Head of Department for the last three years.

George has spent several periods overseas. In 1968-9 he held a Postdoctoral Fellowship at the University of Waterloo, Ontario, and has spent sabbatical leaves at The University of Leicester, UK, Stanford University and The Institute of Cancer Research in London. He has received a Corday Morgan Memorial Fellowship and was a Fulbright Scholar in 1989.

George's research interests are in the determination of crystal structures using the techniques of X-ray diffraction. He collaborates widely with colleagues in Auckland and overseas, and has solved the molecular structures of many newly-synthesised compounds. His present research is focussed on the way in which potential anti-cancer drug molecules bind to selected sequences of DNA oligonucleotides. These studies will afford a better understanding of drug/DNA interactions at the molecular level, and hopefully assist in the future design and synthesis of more efficacious anti-cancer agents.

George became a Member of the New Zealand Institute of Chemistry in 1974 and has been a Fellow since 1982. He has maintained an active interest in the Institute over many years, and has served as Committee member, Council Delegate, Vice-Chairman, and Chairman of the Auckland Branch. He was Vice President of the NZIC in 1998.

MESSAGE FROM THE PRESIDENT

I trust all members were able to enjoy a relaxing break over the holiday season. Most of you will be well and truly back at work by the time this edition of *Chemistry in New Zealand* is published, and so I hope that 1999 has started well and continues to be stimulating for everyone throughout the coming months.

This year, the last of the millennium, is a time when many will look back at changes that have occurred during the century. Major advances have resulted from "quantum leaps" in science, and the subsequent applied technologies have changed our world and had a profound impact on our lives. However, even the most significant advances are but spikes on the very broad continuum of scientific discovery and innovation. Chemistry has been one of the major contributors to the development of the new technologies.

During the 21st century, research chemists will continue to push forward the frontiers of knowledge in both disciplinary and interdisciplinary areas, and industrial chemists and chemical technicians will convert that new knowledge into advantageous technological advances. Teachers will be required at all levels to inform pupils about science and scientific methods, and administrators will need to be even more scientifically literate. Therefore there will continue to be a strong demand for well-trained chemistry graduates. I believe it is very important that chemistry is actively promoted as a viable and rewarding career option for school leavers, and see an increasing role in this for the NZIC. I also believe that all members must take every opportunity to portray chemistry in a positive light to the general public to alleviate apprehension that is often generated by the media about the possibly detrimental role of "chemicals" in our everyday lives.

The main thrust of Council activities in 1998 was the reorganisation of the administrative structure of the NZIC. This resulted in the appointment of Ancat Holdings Ltd (Robert Lyon) to the Virtual Secretariat, and Grant Boston as Honorary General Secretary. Everyone worked productively during 1998 to make significant progress towards the total upgrade of Institute membership records. Alastair MacGibbon can look back with satisfaction at the progress that was achieved under his presidency.

One of the new Council's first priorities will be to complete the administrative reorganisation begun last year. We will also be seeking to identify other improvements that members would like to see implemented. I believe that it is most important that there be well established communication channels through which members can express their points of view, and the new structure greatly facilitates this. The most effective way that members can influence Institute directions is by interaction at the local branch level, where ideas can be collated and position papers prepared for wider dissemination and debate. As President, I will be visiting each branch in the first half of the year and will be pleased to talk to local members about any issues. As well as this, Council would like to hear if you have concerns, and of course we would especially like to receive positive suggestions for new initiatives that would be of benefit to all of us. The real strength of the NZIC comes from active involvement of its members, and so I urge everyone to play an even greater part in the promotion of your profession.

George Clark
NZIC President 1999

BRANCH NEWS

AUCKLAND

ANNUAL REPORT 1998

The branch supported a range of activities during the year, including several scientific meetings and two laboratory tours. Our sponsorship of a number of prizes and of student attendance at conferences continued. Five newsletters were sent to branch members during the year with information on local meetings and other matters of interest to the branch. In order to attract more student members and involve them in the activities of the Institute, a student membership drive was held in March.

Summary of Events

17th March 1998: Talk by Professor John T Yates, Director, Pittsburgh Surface Science Centre, University of Pittsburgh, entitled "Exploring the Interface: Catalysis and Photochemistry at Metal and Metal Oxide Surfaces".

31st March 1998: Visit to Watercare Services Ltd, Wastewater Treatment Plant, Island Road, Mangere, arranged by Ram Sharma.

21st May 1998: Joint meeting with the Australasian Corrosion Association. Talk by Dr Paul Kilmartin, University of Auckland, entitled "Conducting Polymers in Corrosion Prevention.

9th June 1998: Talk by Dr Anne Coxon, Institute of Environmental Science and Research Ltd, entitled "The Chemistry Behind Analysis of Illicit Drugs in New Zealand".

2nd July 1998: Joint Meeting with Auckland Science Teachers Association, and pre-publication launch of the second edition of "Chemical Processes in New Zealand" edited by John E Packer, John Robertson and Heather Wansborough, and a talk by Andries Popping, General Manager, Rohm and Haas NZ Ltd, entitled "Emulsion Polymerisation".

21st July 1998: Presidential Address. Dr Alastair MacGibbon, President of the NZIC, visited the Auckland Branch and gave a talk entitled "A Chemist's View of Buttermaking".

10th August 1998: Royal Society of Chemistry Visiting Lecturer, Professor Michael N Paddon-Row, University of New South Wales, was the RSC Lecturer this year, and his lecture was entitled "An Overview of Recent Insights Gained into the Most Fundamental and Ubiquitous of all Chemical Reactions: Electron Transfer".

27th August 1998: Visit to Tegal Analytical Laboratory, and talk by Dennis Karl, entitled "Near Infrared (NIR) Analysis - A Useful Tool in the Feedmilling Industry".

21-27th September 1998: National Chemistry Week. Members of the Auckland Branch participated in several activities organised through the Department of Chemistry, University of Auckland: A poster competition "Chemistry In Our Lives" for senior primary school children, a crystal-growing contest for intermediate pupils, some chemistry experiments (non-competitive) for third and fourth formers, and some "Chemistry Magic" shows. Some positive publicity for chemistry resulted from reports of some of these events in the *New Zealand Herald*.

24th September 1998: Auckland Branch Dinner, held at "Truffles" restaurant, Auckland Institute of Technology.

27th October 1998: Talk by Dr Paul Anastas, Chief of the Industrial Chemistry Branch, US Environmental Protection Agency, entitled "Green Chemistry: Theory and Practice".

New Fellows

We noted with pleasure the admission of Auckland Branch members Dennis Karl, Jim Metson, Peter Schwerdtfeger, James Wright, and Malcolm Smith as Fellows of the Institute.

Prizes and Sponsorships

The branch continues to see that an important part of its function is to provide prizes and sponsorships for chemistry-related activities and occasions. The following were supported this year:

NZIC prize for the top MSc student in the Department of Chemistry, University of Auckland. The award this year went to David Titheridge.

NZIC prize for the top Bachelor of Applied Science student majoring in Chemistry at the Auckland Institute of Technology. The award this year went to Jingli Zhang.

Sponsorship and three prizes for the 7th formers Chemistry Mastermind quiz held during the annual 7th formers visit to the Chemistry Department, University of Auckland.

Support for two regional science fairs.

Supplementary support for eight students to attend conferences.

Committee Matters

The committee met on an approximately monthly basis in the Department of Chemistry University of Auckland. I would like to record my special thanks to the committee members for their contributions to the smooth running of our various activities this year.

G A Bowmaker

AUCKLAND BRANCH COMMITTEE 1998/1999

Chairperson:	Graham Bowmaker
Address:	Department of Chemistry University of Auckland Private Bag 92019, Auckland
Phone:	09-3737599 x 8303
Fax:	09-3737422
Email:	ga.bowmaker@auckland.ac.nz
Treasurer:	Michael Fitzpatrick
Address:	Kingett Mitchell

P O Box 33-849
Takapuna, Auckland
Phone: 09-4868068
Fax: 09-4868072
Email: mfitzpatrick@kma.co.nz

Delegate: Bruce Graham
Address: P O Box 21-639, Henderson
Phone: 09-8366184
Fax: 09-8388523
Email: bruce.graham@clear.net.nz

Committee:

Cathy Bebelman
Address: Woodward Clyde (NZ) Ltd
P O Box 821, Auckland
Phone: 09-3551300
Fax: 09-3551333

Neil Edmonds
Address: Department of Chemistry
University of Auckland
Private Bag 92019, Auckland
Phone: 09-3737599 x 8342
Fax: 09-3737422
Email: nr.edmonds@auckland.ac.nz

Alan Grout
Address: 33 Hollywood Ave, Epsom, Auckland
Phone: 09-6257500
Email: a.grout@auckland.ac.nz

John Packer
Address: Department of Chemistry
University of Auckland
Private Bag 92019, Auckland
Phone: 09-3737599 x 8315
Fax: 09-3737422
Email: j.packer@auckland.ac.nz

Ram Sharma
Address: Watercare Services Ltd
Private Bag 92802, Penrose, Auckland
Phone: 09-6344880
Fax: 09-6346530

MANAWATU

The 1998 Schools Chemistry Quiz, organised by the Manawatu Branch, was held in September 1998. The Quiz aims to show students how chemistry relates to our everyday life and this year was our best year ever. 1152 Junior and 919 senior students (a total of 2071) from 63 schools entered the 1998 quiz. Instead of sitting the 30 question multi-choice quiz on a specified date, schools this year sat the quiz at a time of their choosing during September. This system proved popular and will be used next year. All the students received acknowledgement of their entries, the 78% who scored over 15/30 got a certificate, and the others a letter encouraging them in their future studies. Gareth Hodges, a fifth former at Wanganui High School, had the highest junior mark of 30, and Hwee Sin Chong, a sixth former at Otago Girls' High School, had the highest senior mark of 28. Prizes for the most students participating were awarded to Taradale High School, Wanganui Collegiate School, and Central Hawkes Bay College. The statistical analysis of the quiz results is shown in the Table below.

Results	Junior	Senior
Mean	19.3	16.4
Std Deviation	4.1	4.2
Median	20	16
Maximum	30	28
Minimum	1	5
1st quartile	16	13
3rd quartile	22	19

The Institute of Fundamental Sciences at Massey University, which contains the Chemistry Group, had an inaugural teaching awards ceremony in December 1998 for recognising quality teaching. The award for 100-level chemistry was won by Dr Tony Wright and the 200/300-level award by Associate Professor Trevor Kitson. Congratulations to both these Manawatu Branch members. Congratulations also to branch member Associate Professor Geoff Jameson who has been elected to the Council of the Society of Crystallographers in Australia, and for being appointed a co-editor of *Acta Crystallographica C*.

Harry Percival

Advance Notice

1999 NZIC Conference

"Chemistry in New Zealand - a Showcase of Activities and Opportunities"

Note Changed Date
21 November - 24 November 1999
at
Victoria University of Wellington

A Special Carbohydrate Symposium
in honour of Emeritus Professor Robin Ferrier
will be held during the Conference on
Tuesday 23 and Wednesday 24 November.

Contacts:
Chairman Of Organising Committee:
Associate Professor Jim Johnston,
Victoria University of Wellington
Conference Office:
School of Chemical and Physical Sciences,
Victoria University of Wellington
Email: Margaret.Brown@vuw.ac.nz
Web Site: www.vuw.ac.nz/chemistry/nzic99

PACIFICHEM 2000 UPDATE

Pacifichem 2000 will be held in Honolulu, Hawaii, between December 14 and 19, 2000. It will follow a similar format to the highly successful meeting held in 1995. The organising committee met in mid-December 1997 to assess the many proposals received in the first round. About 135 proposals were accepted and these will take up about 60% of the available time.

Sessions have been allocated for general papers in the following areas:

1. **AGROCHEMISTRY**
   - including agriculture, cellulose, carbohydrate, pulp and paper chemistry.
2. **ANALYTICAL CHEMISTRY**
   - including clinical, electrochemical and trace analysis.
3. **BIOSCIENCE AND TECHNOLOGY**
   - including microbial and pharmaceutical chemistry.
4. **CHEMISTRY AND THE COMMUNITY**
   - including chemical education (for chemists, non-chemists and the public), chemical economics, and business.
5. **ENVIRONMENTAL CHEMISTRY**
6. **INORGANIC CHEMISTRY**
   - including nuclear and geochemistry.
7. **MACROMOLECULAR CHEMISTRY**
8. **MEDICINAL CHEMISTRY**
9. **ORGANIC CHEMISTRY**
10. **PHYSICAL & THEORETICAL CHEMISTRY**

Further information is available from:

Professor B Halton
Chemistry Department, Victoria University
P O Box 600
Wellington

ARE YOUR SHADES AS COOL AS YOU THINK?

While much of the United States shivered through a record cold and snowy winter, others were playing and watching championship tennis under sunny summer skies in Melbourne, Australia. In addition to seeing the first grand slam tennis tournament of the year at the 1999 Australian Open, spectators learned a bit about the effectiveness of their sunglasses, courtesy of the Anti-Cancer Council of Victoria, Australia (ACCV).

Using a special analytical instrument called the Varian Solascreen ultraviolet-visible (UV-vis) spectrophotometer, the ACCV provided testing of tennis fans' sunglasses for compliance to the Australian Standard for Sunglasses and Fashion Spectacles. Without adequate protection from sun glare, long-term eye damage can occur, leading to cataracts, and in severe cases, even blindness. The United States, England, and many European countries have similar standards for sunglasses.

"In the first week of the Australian Open, we tested 525 pairs of glasses, and found that 87% fell into the 'general purpose' category, meaning they are intended to reduce sun glare in ordinary circumstances," said Craig Sinclair, ACCV SunSmart campaign manager. "In general, the majority of sunglasses tested blocked out all UVB rays, and they tended to offer slightly less protection against the less-damaging UVA rays. Only 2% of the tested sunglasses failed the Australian standard."

"While people are increasingly likely to wear hats and skin protection with the proper SPF factor, they need to think about eyewear, too. Interestingly enough, the price paid for sunglasses does not appear to be a factor in determining how well they perform. Some of the most effective sunglasses, blocking out all UVA and UVB rays, were inexpensive," Sinclair continued.

The non-profit ACCV organisation was at the Australian Open to promote their SunSmart program, a comprehensive skin cancer control program designed to inform and educate the public about the dangers of sun exposure and how to protect themselves.

In addition to sunglasses testing, the Varian Solascreen UV-vis instrument is used to test the sun-blocking characteristics of fabrics.

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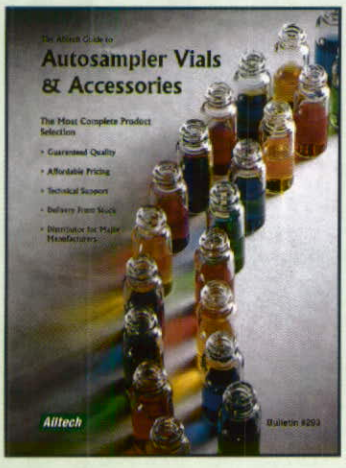

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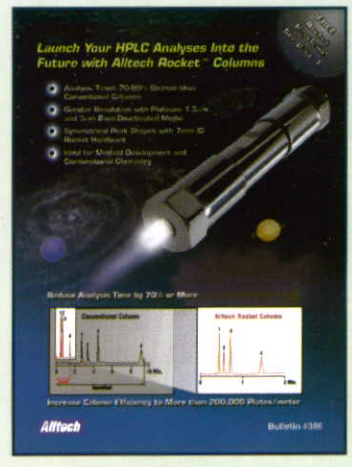
Alltech's new high resolution Digital Flow Check-HR™ (DFC-HR) is the only flowmeter you need for your low flow, GC, and general laboratory applications. It accurately and precisely measures flowrates from 0.01-500SCCM for Air, N_2, H_2, O_2, He and 5% Ar/CH_3 and from 0.01-300SCCM for CO_2. The DFC-HR™ is calibrated with all seven gases using NIST-traceable standards. It carries the CE mark and is year 2000 compliant.

Rocket HPLC Columns



Alltech Rocket™ HPLC columns combine small-particle, high resolution, porous media with a hardware format (33x7mm) that's built for speed. They are packed with 1.5µm or 3µm Platinum™ base-deactivated media, as well as other popular media. Rocket columns generate high efficiency with excellent peak shape while offering unique surface chemistries to solve almost any separation problem.

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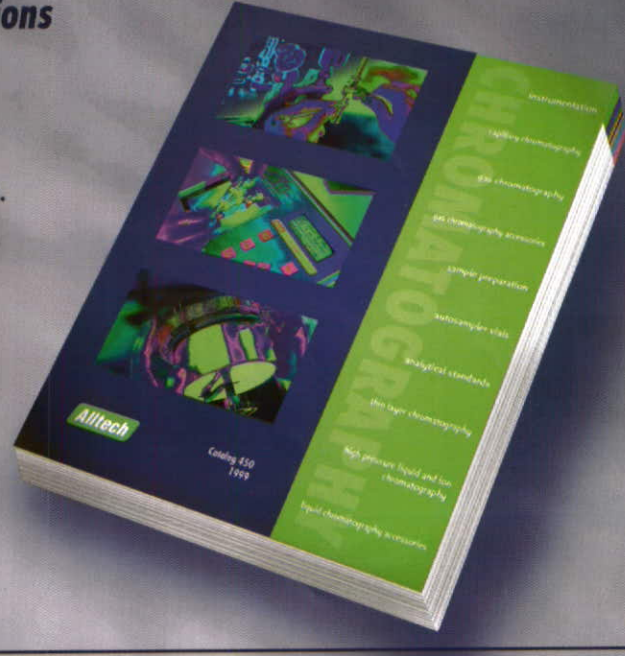

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