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NZIC Chemistry IN NEW ZEALAND

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IN NEW ZEALAND

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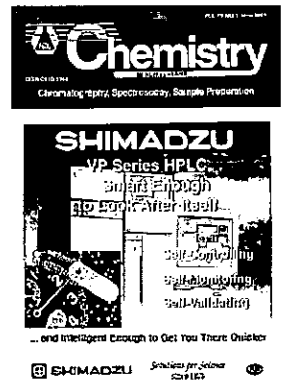

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SUCCESSES AT PACIFICHEM 2000

The New Zealand contingent at Pacifichem 2000 was smaller than expected (36 of the 9,321 registrants) but it established its presence in no small way.

Sarah Hickford, the NZIC sponsored PhD student to Pacifichem was one of the forty prizewinners in the Student Paper Competition for her paper in the Organic Section entitled "Microbial Origins and Tumour Targeting of Cyclotoxins". She is supervised at the University of Canterbury by Professors John Blunt and Murray Munro. Her university compatriot Mark Bart (supervised by Professor Peter Harland) also won one of the prizes in the Physical Section with his paper "Studies of Electron and Ion-molecule Collisions Using Crossed Beams and Ion Imaging". In comparison, our Australian doctoral colleagues had no success in the competition.

In addition to the 35 papers presented by New Zealand authors, Professor Murray Munro contributed to a live Pacifichem webcast entitled "The World's Oceans – Medicine Chest of the Future?". The Publicity Office highlighted New Zealand studies on meat storage (paper by Braggins,* Agnew, Frost, Podmore, and Cummings of AgResearch - Food Systems), the native Asian kozo tree and its constituent chemical with promise for AIDS treatment (paper by Park,* Brimble and Taylor of The University of Auckland), and marine sponges (the Blunt/Munro University of Canterbury group again).

The New Zealand Institute of Chemistry had Professor John Blunt as its Presidential Representative and in addition to his address at the Opening Ceremony he was able to have meaningful discussions with our sister society Presidents. As a result of these interactions and others with the NZIC Member on the Planning Committee, we will receive a visit in July from Dr Paul Walter, a Past-President of the American Chemical Society, Pacifichem Committee Member, and a recently appointed ACS Roving Ambassador who wishes to further ACS-NZIC relations.

In this context, the Debriefing Meeting of Pacifichem 2000 will take place in mid-June. We trust that the role of the NZIC in the organisation of future meetings will be reaffirmed and that the Societies will be asked to schedule Pacifichem 2005 likely with an expanded Organising Committee that will embrace Korea.

NZ Science Scene

ROYAL RECOGNITION FOR SCIENTISTS

The Queen's Birthday awards, announced recently, conferred the Companionship of the New Zealand Order of Merit upon two New Zealand scientists.

Professor Sir Raymond Firth, now living in London, was awarded the Companionship of the New Zealand Order of Merit for his services to anthropology. Professor Firth is an Honorary Fellow of the Royal Society of New Zealand, and he celebrated his 100th birthday at the end of March this year.

Professor Alexander Knox of Christchurch, a Fellow of the Royal Society of New Zealand, was also awarded a Companionship of the New Zealand Order of Merit for his services to ecology and biological science.

Ai SCIENTIFIC EXPANDS COMMITMENT TO THE ANALYTICAL MARKET

Following on from the recent establishment of the Ai Scientific and Dionex joint venture Stephen Pronk, CEO of Ai Scientific, announced the appointment of Ulrick Russ to head Ai Scientific's expanded operation in New Zealand and Australia. Mr Pronk said "With Ulrick having previously held senior roles at Perkin Elmer and Millipore-Waters he brings a wealth of experience to Ai Scientific, experience that compliments our partnerships with Varian and Dionex." Recognising the requirement today for analytical precision and reliability Mr Pronk continued, "Ulrick is responsible for ensuring the New Zealand and Australian laboratories receive technical solutions of the highest calibre." To this end he has recruited John Harvey, an experienced Dionex Sales Specialist from the UK now based in Auckland, and Helen Lawrence, who has joined the technical sales team from the research facility at Charles Sturt University. Mr Pronk went on to say "A major initiative of the Ai Scientific/Dionex joint-venture is the appointment of Mark Albertson as Regional Dionex Technical Specialist for New Zealand and Australia." Mark recently hosted a series of ion analysis seminars in conjunction with Peter Jackson, a well-respected Australian chromatography expert now employed as the Environmental Specialist for Dionex in the USA. The seminars, held in centres around New Zealand and Australia, brought hundreds of chromatographers up to date with the latest applications and technologies. "it is not just our customers who receive training, the Ai Scientific team needs to stay abreast of the latest developments," said Mr Pronk. Ulrick Russ continued, "we have just had Kevin Brennan, our Service Manager, return from technical training in Germany and Helen has received training at the Dionex complex in the USA, Our New Zealand Service Engineers, Dinesh Soans and Martin Little, have recently received training with Varian and Bio-Rad respectively." In an additional commitment a substantial investment has been made in Ai Scientific's application laboratory, headed by Dr Tim Williams, to outfit it with a full range of instrumentation. "It is an impressive set-up," Mr Russ commented. "Ai Scientific can now provide chemists with an enhanced array of services including application development, evaluation of customer samples as well as a range of training courses."

RESEARCH THE ANSWER TO REDUCING METHANE EMISSIONS

Research and development, not taxation, offers the best prospects for reducing methane emissions from sheep and cattle, says Hon. Pete Hodgson, Convenor of the Ministerial Group on Climate Change. Mr Hodgson said the Government was committed to increasing funding to accelerate research currently under way to reduce methane emissions from livestock. Methane emissions from sheep and cattle account for about half of New Zealand's total greenhouse gas emissions. "Research into livestock digestion and pasture composition may deliver the double benefit of reducing emissions while improving the efficiency of the animals' conversion of food to bodyweight," Mr Hodgson said. "This is the most promising avenue for tackling greenhouse gas emissions from farming and we are looking for partnership funding for such research from the farming community."

$5 MILLION PACKAGE TO ENCOURAGE PEOPLE INTO TEACHING

Education Minister, Hon. Trevor Mallard has announced a $5 million package to encourage people into teaching, particularly into the secondary sector. "At the moment there is a bulge in student numbers on primary school rolls," Trevor Mallard said. "That will soon impact on our secondary schools and we need good teachers in place to cope with the extra students." The key points of this package are: An unlimited number of allowances (of up to $10,000) for people willing to teach in 'hard to staff' secondary school subjects including maths, computing, physical education and Maori. Funding to help secondary trainees gain practical experience in isolated schools. More TeachNZ rural scholarships and increasing the International Relocation Grant to encourage New Zealand trained teachers to return to New Zealand. The financial initiatives package is effective immediately. Students finishing degrees in maths, physics, computing, physical education or te reo Maori and wanting to teach in secondary schools, can apply for these allowances now."

Peter Spratt, Manager, Education, Royal Society of New Zealand responded to the announcement saying "Government has begun to address the

looming crisis in teacher supply. This week's announcement of incentives to encourage people into teaching represents a necessary step on the way to ensuring well qualified, enthusiastic and motivated teachers in secondary schools. The financial assistance offered will be much appreciated by young teachers, particularly those with student loans. But money alone may not be sufficient to address the retention challenge in New Zealand schools. Many teachers teach for a few years before leaving for positions overseas or for careers in New Zealand outside of teaching. New Zealand needs to support practising teachers at the same time as encouraging new recruits. Conditions of service, particularly time allowances for professional development, administration and assessment, and provision of adequate technical support, must be improved if we are to keep those passionate, highly able teachers, who enthuse and motivate young New Zealanders in the sciences, mathematics and technology. Without them, New Zealand's drive to a knowledge society will be compromised from the very beginning".

2001 CHARLES FLEMING AWARD NOMINATIONS

The Charles Fleming Award for Environmental Achievement was established in 1988 to commemorate the life and work of Charles Alexander Fleming, KBE, BA, DSc (NZ), DSc (Hon. Causa) Wellington and Auckland, FRS, FRSNZ, FMANZ, Hon FZS, Hon FGS, For. Mem. Amer. Phil. Soc. Charles Fleming (1916 - 1987) was deeply concerned with issues of environmental conservation, and the award grew out of his love of nature and concern for the environment, and seeks to honour those who have achieved distinction in the protection, maintenance, management, improvement, or understanding of the environment. Eligibility: Citizens of New Zealand are invited to nominate individuals, groups or organisations domiciled in New Zealand who have benefited humanity in the general fields of ecology and enviromental science. Nominees will be judged by accepted international standards. Nominators may not nominate themselves. In making the awards, preference will be normally given to individuals. *Selection Criteria:* The prime purpose of the award is to recognise achievement in the protection, maintenance, management, improvement or understanding of the environment. For full details of what information is required please email awards@rsnz.govt.nz
Frequency of award: The award is made every three years and consists of a medal, a cash grant, and an all expenses paid public lecture tour, visiting selected Regional Science Societies. The lecture tour will take place during 2002.

e-LEARNING ADVISORY GROUP TO BE APPOINTED

Associate Education Minister, Steve Maharey, announced earlier this month that an expert group will be appointed to advise the Government on how New Zealand's tertiary education institutions can take advantage of new learning technologies. Mr Maharey said he was seeking 7-9 experts from the tertiary education and ICT sectors who have developed capability and expertise in various forms of flexible learning to work together over the next four months. The role of the Advisory Group is to identify existing e-learning infrastructure and capability; advise on how existing e-learning infrastructure and capability can be used to develop the e-learning capability of the tertiary education sector as a whole; recommend steps that can be taken to secure co-operation, collaboration and the sharing of resources; identify barriers to developing further e-learning capability and means to address these barriers; explore mechanisms for ensuring the ongoing co-ordination of e-learning capability and enabling the sector to respond effectively to future learning needs; evaluate good practice in flexible teaching and learning; recommend incentives for capability and staff development; advise on how best to link with existing commercial expertise; advise on processes that allow for the identification, monitoring and management of risks that may emerge with developing e-learning capability; advise on how e-learning can contribute to the export education industry; and develop frameworks for quality assurance and intellectual property rights management in line with international developments. The group will provide a report to the Ministry of Education by 31 October 2001. While the group will meet on a number of occasions, most interactions between members will be conducted on-line.

NEW ZEALAND SUPPORTS INTERNATIONAL CONTROL OF TOXIC SUBSTANCES

New Zealand has signed up to the Stockholm Convention on Persistent Organic Pollutants (POPs). The "POPs" Convention aims to protect human health and the environment from some of the world's most dangerous pollutants. It covers 12 pollutants, known as "the dirty dozen", because they are highly toxic, degrade very slowly, accumulate in the food chain, and travel long distances.The Convention bans production and use of 10 POP chemicals and commits countries to minimise releases of a further two unintentional by-product pollutants. It also establishes a mechanism for adding new POPs to the list in the future, subject to scientific criteria. New Zealand has already de-registered or made illegal the production or use of such POPs as DDT and dieldren. Minister of the Environment, Hon. Marion Hobbs, said "Dioxin emissions have been reduced over the past decade and further reductions will be sought. All New Zealanders will have a role to play, as dioxins are emitted by both industrial and domestic activity, and particularly by the burning of wastes."

FRST APPOINTMENT

Dr John Smart has joined the Foundation For Research Science and Technology (FRST) as its Group Manager, Portfolio Management. This is a new position that has been established as part of the restructuring of the organisation. The Portfolio Investments Division is responsible for reviewing and developing portfolios of research, science and technology that provides the strategic direction for the Foundation's future funding

investments. Dr Smart has a Master of Management from Victoria University and a PhD in Biochemistry from Massey University. Prior to joining the Foundation, Dr Smart has held various research management positions within the dairy industry.

GOVERNMENT SEEKS PUBLIC VIEWS ON THE ENVIRONMENT

The Ministry for the Environment is seeking community views on the progress New Zealand is making with its key environmental problems. The 'Rio+10' community programme, launched in early May, asks what environmental issues matter to you, and what you think most needs to be done in future. "The aim is to hear from as many individuals and organisations as possible, and not just those traditionally identified with 'the environment'," says Rio+10 National Co-ordinator, Lesley Woudberg. People can get involved by filling in a Rio+10 response form, or by using a Rio+10 starter kit to facilitate discussions within their local community, before July this year. The public response will help to inform the Ministry's future work priorities, and will be incorporated into an international report that New Zealand is preparing for next year's World Summit on Sustainable Development. The World Summit follows on from the first 'Earth Summit', held in Rio de Janiero in 1992, which saw a number of important environmental and sustainable development agreements signed, such as the Framework Convention on Climate Change. World leaders will use next year's summit to review progress since Rio and to set priorities for the future. The 'Rio+10' response form and starter kits are available on-line at: http://www.mfe.govt.nz/new/rio.htm

NZIC BRANCH NEWS

AUCKLAND

The Auckland Branch of the NZIC wishes to congratulate Graham Bowmaker on his promotion to a Personal Chair (Professorship) at the University of Auckland. Graham's main research interest involves the study of molecular structure and bonding by magnetic resonance and vibrational spectroscopic methods. He also has an interest in organic molecules with unusual physical properties. Graham has been active in NZIC affairs for a number of years, and was the chair of the Auckland Branch from 1997-1999. The present committee extends their best wishes to their Immediate Past-Chairman.

WAIKATO

The Waikato Branch kicked off in 2001with the annual recruitment drive BBQ held at the University of Waikato. The BBQ was well attended with more than 50 chemists and aspiring chemists attending and proved fertile ground for recruitment with 5 new members signed up. Dr Richard Coll was elected Waikato Branch Representative for the NZIC Council and travelled to Christchurch in early April for the first Council meeting of the year. Richard replaced Pat Holland, Waikato Council Representative, as Pat has recently left HortResearch to take up a new position with the Cawthron Institute in Nelson. The Branch wishes to express its sincere thanks to Pat for many years of dedicated service and wishes him well in his new challenge.

The Council approved the Branch budget for the year and this has enabled some welcome time for advanced planning. Upcoming activities include the joint NZIC-Hill Laboratories sponsored analytical chemistry contest along with the Presidents visit and RSC visit. The Branch is also planning a major activity along the lines of the highly successful fireworks display by Martin Van Tiel that proved so popular last year. The planned tour of New Zealand by Professor Alan McDiarmid, Nobel Laurate, is unfortunately omitting Hamilton, but the Branch intends liasing with Auckland to attend the visit there, and will provide transport for Branch members.

University news centred on MSc and PhD completions, and graduates returning to New Zealand after work or fellowships overseas. Lea Bonnington recently successfully defended her PhD thesis on the analysis and degradation products of organosilicone surfactants (a project in conjunction with the Forest Research Institute, Rotorua), and is now looking for an overseas postdoctoral fellowship. Steve Alley has just submitted his PhD thesis on the chemistry of ferrocenyl-phosphorus and arsenic compounds, and in the course of his work has discovered some remarkably air-stable primary alkylphosphines and arsines. Maarten Dinger (PhD, 1998) is now doing a second postdoctoral fellowship at the University of Amsterdam. We recently welcomed Dr Meto Leach (PhD, 1998) back to the Chemistry Department at Waikato, after a stint at Otago. Meto has moved into the area of natural products chemistry. Rebecca Taylor has moved to Australia to do a PhD at ANU, following in the footsteps of Gwion Harfoot. Scott McIndoe has a five-year appointment as a College Lecturer with Trinity and Newnham. Scott has recently had published a book he co-authored with Paul Dyson, "Transitional Metal Carbonyl Cluster Chemistry." Two ex-students have recently returned to Hamilton to Scientist positions with NIWA — Trevor Mathieson after post-doctoral work in Munich with Hubert Schmidbaur, and Craig Depree after post-doctoral work at Massey and Otago Universities with the Brodie/Ainscough and Brooker groups respectively.

MANAWATU

The May meeting of the Branch was addressed by David Parry, Professor of Biophysics at Massey University on the topic of "Hair Structure at the Molecular Level." As an experiment, the meeting was held at the early time of 6.30 pm and followed by dinner for the speaker and others at a nearby café. In an interesting lecture, David covered his exploration and elucidation of the structure of hair and explained how data which appeared contradictory and incompatible, can now be understood. Hair will never be the same for the audience. David was awarded the Hector Medal by the Royal Society of New Zealand last year for his research into hair structure.

The Branch Chairman, Richard Haverkamp, has been appointed to the Board of the Institute of Professional Engineers of New Zealand (a professional body with around 8000 members). Earlier this year he attended The Minerals, Metals and Materials Society Conference in New Orleans, USA.

To celebrate Nobel Prize winner Allan MacDiarmid's visit to Massey University and Palmerston North, the Branch is organizing a competition for high school students. Professor MacDiarmid will award two of the prizes, of $100 each, at his public lecture and others will awarded to those who cannot attend. All correct entries will receive a certificate. The quiz can be downloaded from the Massey University web page at http://IFS.massey.ac.nz/research/MacDiarmid/quiz.htm.

Landcare Research

Benny Theng has just returned from 10 months in Japan where he was JSPS Fellow and Visiting Professor at the Institute for Environmental Sciences at the University of Shizuoka. He participated in research on the acid weathering of minerals and was able to complete his Marsden funded project on the clay-fullerene interaction. He attended several conferences including the International Acid Rain 2000 Meeting in Tsukuba and visited a number of universities. He recommends Japan as a country to visit even if you do not speak the language!

Massey University

Gavin Hedwig has been awarded a Royal Society of Chemistry grant to enable him to continue his collaborative research at the University of Lethbridge, Alberta, Canada and has been appointed Adjunct Professor in the Department of Chemistry and Biochemistry at the same University.

Tony Wright and Emily Parker were among the recipients of Distinguished Teaching Awards for 2000 as recognition of their excellent teaching records in chemistry at Massey University.

Nick Evans, who obtained first class honours in chemistry last year, has been awarded a Commonwealth Scholarship to undertake PhD research on polymers with Andrew Holmes at Cambridge University. He will be in Clare College.

The Science Common Room now houses a pool table which can be used by graduate students in chemistry as well as their colleagues in other disciplines. This was obtained at the suggestion of the graduate students themselves and it just happened that a local bowling club had one that it wanted to relocate!

WELLINGTON

The latter part of 2000 saw the Wellington Branch lectures well attended, likely due to the excellent programme arranged by Professor John Spencer and his team on the Branch Committee.

The RSC lecture delivered by Professor Len Lindoy in late July provided the academic community with a lecture packed with high calibre examples of new supramolecules from his studies formerly at James Cook and now Sydney University. August saw Dr Jeff Tallon (Industrial Research Ltd and former James Cook Fellow) provide a "Millennial Musing" with the bicentennial of Volta and the battery. The October meeting proved the best attended of the year with Dr Ian Shaw visiting from Christchurch and providing an address on "Toxic Chemicals in Food". The large audience was given an elegant and valuable discourse and a return visit is eagerly awaited by many. With all of the political discussion on genetic engineering the last meeting of the year was addressed by Dr Michael Berridge of the Malagan Institute. His topic was "Electron Transfer at the Cell Surface".

In December a small group from Victoria University (Professor Brian Halton and PhD student Carissa Jones, Drs Johnston and postdoctoral Thomas Borrmann, and PhD (now graduated) Lyndon West attended Pacifichem 2000 and presented their work in lectures and poster format. Ms Jones' attendance was made possible with support from RSNZ, VUW, and the NZIC Wellington Branch.

The 2001 Branch programme got off to a good start with a site visit to South Pacific Tyres NZ Ltd in the Hutt Valley. After a generous buffet supplied by the company our host for the evening, Pierre Daigneault, Technical Manager for the company, explained the intricacies of tyre technology and the part played by chemistry in the design of polymers for use in tyres for the family car, large trucks and even aircraft. The audience, many of whom clearly had a keen interest in motoring, engaged Pierre in an extended discussion following the talk. The meeting then divided into two and Pierre, with assistance from Chief Chemist Dave Hanley lead the groups through the production facility where they were able to follow the various stages of tyre manufacture through to the final product.

In March the challenges and rewards of boutique cheese production were explained by Ross McCallum, Managing Director of Kapiti Cheeses, while the large and enthusiastic audience experienced the delights of sampling a selection of his cheeses accompanied by some well-chosen beers and wines. The talk was both amusing and informative. For example, many of the those in the audience would

have been unaware of the significant differences between the bulk manufacture of cheddar and the production of some of the special cheese varieties which require daily turning and washing as they mature.

April saw the Presidential visit to the Branch of Professor Leon Phillips. This is always an important meeting as it gives the local members an opportunity to raise issues of importance and to hear the official Institute response to their concerns. In this case Leon was able to reassure members that plans were well advanced to have *Chemistry in New Zealand* back in production. Professor Phillips then took his audience on a tour across the Solar System to Venus where the harsh chemistry of the Venusian atmosphere is now revealing its secrets. The talk was illustrated by some spectacularly beautiful photographs of the planet, but few felt tempted to visit once Leon had explained that the famous clouds consist mostly of sulfuric acid.

In June Dr Vincent Gray presented an address that outlined the work for which Maurice Wilkins shared the 1962 Physiology/Medicine Nobel Prize and to whom a memorial has recently been unveiled in Pongaroa (Wairarapa) with sponsorship by the NZIC. At the end of the month Professor Terry Collins, an Auckland PhD graduate now Professor of Chemistry at Carnegie Mellon University in Pittsburg gives the 2001 Mellor Lecture on "Green Chemistry: Sustaining a High Technology Civilisation". This will precede his visit to the Chem NZ conference in Christchurch.

June is rather busy for the Wellington chemists as Professor Alan MacDiarmid is scheduled not simply to delivers his Wellington Public Lecture but also to host a half day symposium on New Materials at Victoria University.

CANTERBURY

New Zealand Is Different has been reprinted, and copies of the reprinted and updated text are available – for further information, please contact Denis Hogan.

At the University of Canterbury, Ward Robinson has retired from his full-time Professorship and taken a half-time one so will continue to direct the data collection and crystallographic assistance research activities that his structure analysis laboratory has provided for the past 34 years. Dr Jan Wikaira manages the throughput of this work and will be happy to hear from anyone wanting assistance with either single crystal X-ray data sets or wood fibre diffraction. Rod Claridge will also retire shortly and take up a similar half-time appointment. Graeme Townsend has taken up a position in Foundation Studies. John Blunt will step down from being Head of the Chemistry Department at the end of his present term and resume the life of an only mildly-harassed academic. Bryce Williamson will be the new Head Of Department.

Tim Oughton is presently Acting Rector of St Andrew's College following the appointment of Barry Maister to be CEO of the New Zealand Olympic Organisation. Barry's brother Selwyn has retired as Head of Science and Technology at Christchurch Polytechnic to be Director of the Canterbury Sports Organisation.

We regret to report the deaths of John Pollard, Martin Viney, and Alf Baker.

OTAGO

The Department of Chemistry building is now officially asbestos-free, after a year's work to remove all the asbestos that was used in its construction in the early 1970s. We hope that it was replaced with something a little less insidious.

Two recent promotions to Associate Professor were announced recently. Congratulations go to Associate Professors Jim McQuillan and Sally Brooker.

Dave Larsen and Sally Brooker recently returned from periods of sabbatical leave in the UK. Two of the three marine chemists in the department, Keith Hunter and Barrie Peake, are currently on sabbatical, in the USA and Nelson respectively, and will be returning in time for the second semester. The other marine chemist, Russell Frew, will be breathing a sigh of relief. Rex Weavers is currently on sabbatical in the department, relishing watching the rest of us mark first-year exams. He will spend the next 6 months in Melbourne. Henrik Kjaergaard is leaving for a six month sabbatical in Boulder, Colorado, USA where he will no doubt be bemoaning the current state of the New Zealand dollar. He recently spent a week in Japan on a collaborative project, while Keith Gordon also spent a week in Japan as an invited speaker at the 10th Time Resolved Vibrational Spectroscopy Conference. Henrik and Keith also attended Pacifichem 2000 in December. They have yet to use up the accumulated air points.

Members of the departmental materials research theme attended the Condensed Matter Meeting at Portage in late January. A truly fantastic place for a conference and a real eye-opener for we chemists at what was essentially a physics conference.

The department has initiated a monthly column in the Otago Daily Times entitled "Chemistry Matters". A sample may be seen at

http://www1.odt.co.nz/cgi-bin/getitem?date=04Jun2001&object=GNF49I0589LS&type=html

This appears on the first Monday of every month. Clamour for it to be syndicated in your local daily paper.

PATENT Proze

by Jane Calvert and Greg Lynch

Baldwin Shelston Waters, P O Box 852 Wellington, Email: email@bswip.co.nz,
Internet: http://www.bswip.co.nz

EXPERIMENTAL USE: A DEFENCE TO PATENT INFRINGEMENT

It may be of interest to scientists that there is a possible exemption from liability for patent infringement for research conducted within New Zealand.

Background – Legal Framework

New Zealand's Patents Act 1953 does not specifically exclude experimental use from patent infringement. However, the New Zealand courts have adopted such an exemption.

One of the problems with this exemption is defining what activities are considered experimental use. Two New Zealand cases have grappled with this issue and affirmed that there is a distinction between research of an experimental nature and research with a commercial advantage in mind. However, because of the limited case law there is still some uncertainty as to where this line actually falls.

The best indication on how the courts approach experimental use has come from the Court of Appeal in the 1991 case *Smith Kline & French Laboratories Ltd v Attorney-General* where Hardie Boys J stated:

"Doubtless experimentation will usually have an ultimate commercial objective; where it ends and infringement begins must often be a matter of degree. If the person concerned keeps his activities to himself, and does no more than further his own knowledge or skill, even though commercial advantage may be his final goal, he does not infringe. But if he goes beyond that, and uses the invention or makes it available to others, in a way that serves to advance in the actual market place, then he infringes..."

Therefore, in defining experimental use, the courts will hold any apparent experimental use which shows any advancement within the commercial sector to constitute an infringement.

An example of experimental activities deriving a commercial advantage and therefore infringing a patent was seen in the 1984 New Zealand case of *Monsanto v Stauffer Chemical Co.* The patent covering the successful herbicide, glyphosate was owned by Monsanto. Stauffer conducted several field trials of their herbicide, later called sulfasate.

Stauffer believed that sulfasate was not covered by the claims of the patent and commenced trial work within the UK and New Zealand to show the effectiveness of the compound under local climatic conditions and against indigenous weeds. These trials were also used as the first step in gaining regulatory approval under the Pesticides Act.

Monsanto successfully sued for infringement. It was held that the compound sulfasate was covered by Monsanto's claims and that the field trials conferred a commercial benefit to Stauffer, by placing them in a better position to market sulfasate rather than purely expanding their knowledge.

Practical Application of the Exemption

Although New Zealand law does have an "experimental use exemption", on a practical level it is important to evaluate the particular activity/experiment on a case by case basis with particular regard to the goal to be achieved. Keeping this in mind, it is our view that an academic institution, such as a university, would not have any more success raising a defence relying on the experimental use exemption than a more commercially orientated company.

To help you in considering whether any particular research activity could be an infringement of a patent our recommended approach would be as follows:

Firstly, determine whether there is a granted and in force patent in New Zealand covering the technology in question.

- Determine the scope of the claims of the patent.
- Consider both the method and goals of the particular activity that you have in mind in relation to the scope of the claims of the patent.
- Determine whether such activity is likely to be considered to enable you to make commercial advances in the market place or whether the research is simply going to add knowledge.
- Finally, determine whether there are any grounds to challenge the validity of the patent at issue.

In essence, the approach that we recommend is quite straightforward. However, the application of this approach may prove to be more difficult depending on the particular situation. We would be happy to provide comment on a particular situation if you require.

Jane Calvert

Jane Calvert and Greg Lynch are both patent attorneys and solicitors at Baldwin Shelston Waters, where they specialise in chemistry and biotechnology patents. Jane joined BSW after completing a PhD in chemistry at the University of Canterbury in 1994. Greg also joined BSW 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 two years as a post-doctoral researcher at Oxford University.

Greg Lynch

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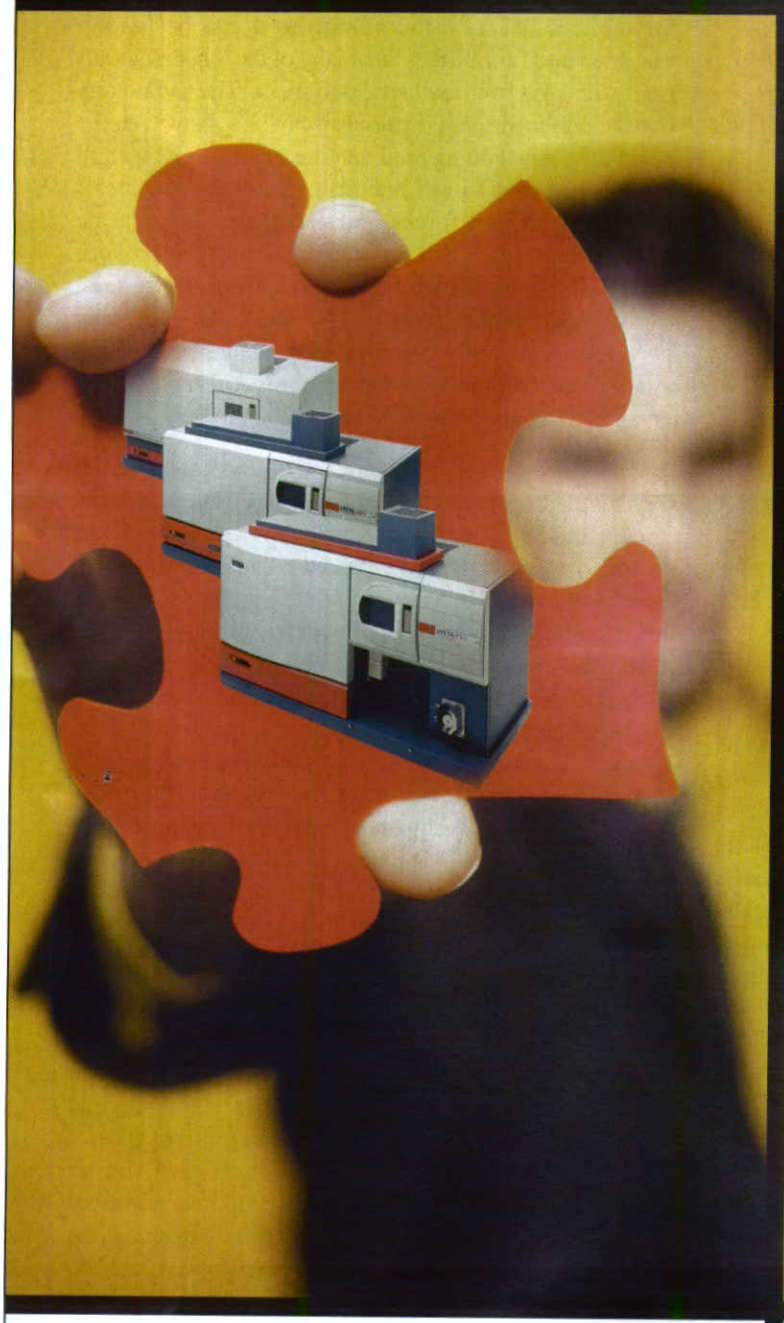

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Renewable Materials In Europe. A Report From Green-Tech 2000, An International Conference On Sustainable And Renewable Raw Materials

Dr Rob Kelly
Wool Research Organisation of New Zealand, Private Bag 4749, Christchurch
Email: kelly@wronz.org.nz

Introduction

Renewable materials, derived largely from non-food crops, have the potential to be used as the major feedstock for the chemicals industry, displacing fossil fuel derived materials and making the industry sustainable in the long term. Presentations at the GreenTech 2000 conference on Sustainable and Renewable Raw Materials, held in April last year at Utrecht in the Netherlands, indicate that the promise of renewable materials is becoming a commercial reality.

The need to move away from dependence on fossil fuels has long been recognised and the driving forces for the use of renewable materials are clear. Fossil fuels are a rapidly dwindling resource, whereas renewable materials are sustainable in the long term. The environmental impact of renewable materials is much less than fossil fuels at all stages of the production life cycle. Renewable materials are CO_2 neutral, with the potential to emit only what they sequester during growth.

Opportunities for renewables

Specific opportunities exist for renewable materials to be used in a wide range of product areas. Delegates at the conference highlighted the point that niche market products that have been traditionally produced from renewable materials have allowed technical developments to advance to a certain point. However, if renewable materials are to establish a foothold in the major markets and compete seriously with synthetic materials, attention needs to move to mass market products. Products that have succeeded, or have the potential to succeed, in the high volume markets, were the major focus of subsequent conference presentations.

For example, the use of natural fibres reinforced with resin to make composite materials is a growing area of research. Fibres such as hemp, flax and jute, are being used increasingly to replace glass and synthetic fibres for the manufacture of composites, particularly for car interiors, with flax-polyester resin biocomposites proving particularly successful. Composites offer better strength to weight characteristics, which leads to greater fuel efficiency and CO_2 benefits beyond the fibre itself. The car interiors market for natural fibres is currently around 350,000 tons per annum, with up to 10 kg of fibre being used per car. The car industry also represents an area of good added value, important for the establishment of new products, and is facing tight regulations in Europe with regards to recyclability.

NatureWorks™ is a degradable polymer made from polylactic acid. As a thermoplastic it can be readily processed into films, fibres and many of the other materials usually derived from synthetic polymers. The technology to make polylactic acid materials is not new; however, the launch of a new commercial venture has required Cargill Incorporated and Dow Chemical, two major chemicals companies, to join forces and establish a large scale (140,000 tons per annum) production facility to produce lactic acid by fermentation of starch from agricultural sources, such as corn and rice. NatureWorks™ is being marketed as the only commercially viable polymer to combine performance and cost competitiveness with outstanding environmental benefits.

Polymer films derived from starch, with physical properties very similar to polyethylene, are being used as mulch film, composting bags, shopping bags by supermarket chains in both Italy and Norway, and as backing sheets in disposable nappies in Sweden. In the nappies product the starch bioplastic offers superior breathability properties, as well as the environmental benefits. Starch films are typically much more permeable to water vapour than LDPE, whereas oxygen permeability is significantly less. Tuning these barrier properties is an active area of research at the TNO Institute of Industrial Technology in the Netherlands, with investigators employing techniques such as homogeneously dispersing functionalised, layered silicates in the thermoplastic starch using melt processing, and the blending of starch with other degradable polymers, such as microbial polyesters, to achieve more desirable hydrophobic properties.

Starch is also establishing a place in the packaging foams market, with soluble foams in use in the US and European markets. More recent developments in starch related products include the use of corn products as fillers for tyres, replacing carbon black. These products give similar performance from a lighter tyre, which in turn improves car efficiency and reduces CO_2 emissions. Novamont, an Italian based producer of starch bioplastics, indicated to the conference attendees that the market for starch-based bioplastics is currently quite small, approximately 2000 tons per annum, but this is projected to increase to 120,000 tons by 2002, driven by the transition from niche to mass market products.

Surfactants in the personal care industry is an area in which the consumer perception of natural materials being mild and 'harmless' is leading to a market pull for renewable materials. Speakers at the conference emphasised the point that although there is not necessarily a connection between natural materials and mild performance, they were developing materials to meet consumer's expectations.

Ninety percent of surfactants used in the personal care industry already have a lipophilic component derived from renewable resources, such as palm oils. Renewables research in this area is focussing on the hydrophilic component of the surfactant. Proteins and peptides of plant and animal origin, as well as carbohydrates from a range of sources, are possible hydrophilic components. Biosurfactants, naturally occurring chemicals that exhibit surfactant properties such as glucolipids produced by microorganisms, currently have little commercial use, mostly due to their method of production. Consequently, chemical modification is important in joining lipophilic and hydrophilic components derived from renewable materials in order to produce a commercially viable renewable surfactant.

Carbohydrate esters, such as glucoside and sucrose esters, find particular use in the cosmetics market, whereas glucamides are used increasingly in the wider detergent sector. Alkyl polyglucosides are also of interest in the cosmetics market, and are an example of a class of renewable material where chemical modification is being used to tune product properties. The inherently non-ionic carbohydrate surfactants can be given charge through oxidation or sulfonation, to generate anionic surfactants, or quaternisation to generate cationic surfactants. The Belgium based company Cerestar is active in this area of research. The carbohydrates market for non-ionic surfactants is approximately 60,000 tons per annum.

Obstacles to commercialisation

While new commercial opportunities exist with the introduction of new products with an interesting range of new properties, the obstacles that have hindered the commercial use of non-food crops are also clear. Renewable materials have to compete with the well-established and highly efficient petrochemicals industry, and significant financial commitment is required to establish a suitable scale of production of renewables to allow direct competition. The issue of quality and consistency of material supply was voiced by several potential users of renewable materials attending the conference and has been cited as one of the reasons that Biopol™, a biodegradable polyester derived from microbial sources and commercialised in the 1970s, has still to fulfil its potential. The time required to establish a new product in the market means that investors' expectations of short term returns are difficult to meet.

The issue of consumer demand was identified as having been one of the major stumbling blocks for the successful commercialisation of renewable materials. For sometime, research and development has pushed the advancement of non-food crops to a stage where sustainable equivalents to many petrochemical products now exist. However, without the market pull (i.e., the genuine desire of consumers to use the products) the growth of the renewables industry has been stilted. It would seem that the market pull is now beginning to emerge as a positive factor and that commercialisation is indeed becoming a reality.

Political influences

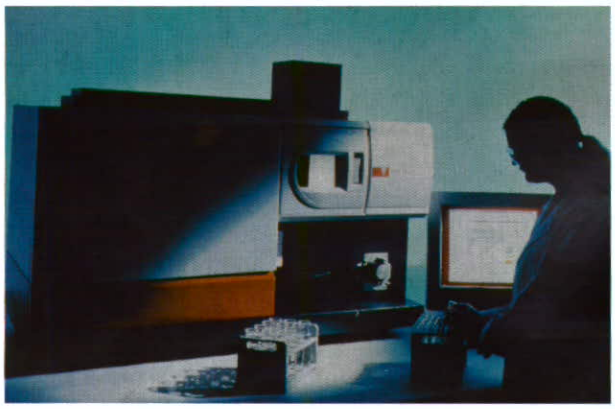
The role of politics and regulations in the future of renewable materials was demonstrated in discussions relating to energy derived from biomass. Biodiesel, formed largely from the esterification with methanol of the products of rape seed oil hydrolysis, is sold in many European countries. In Germany it is price competitive, as it is not subject to the same taxes as petrochemical diesel. In Britain, trials were conducted by the Reading Council to run their buses on the fuel. The major complaint was that the town smelled like a fish and chip shop.

The political will is there to ensure the future of renewable materials. Representatives from three different sectors of the European Commission were present at the conference to encourage further research into renewables, and taxes aimed at penalising the use of non-renewables, such as landfill taxes and carbon taxes, are set to increase.

However, the future of one of the most important political supports for the European renewable materials industry is less clear. Non-food crops are grown largely on set aside land, subsidised by governments to avoid the problems of overproduction of food. This broad-based subsidy has allowed non-food crops to get a foothold in the market in spite of the competition presented by petrochemical products. If this subsidy were to change, which may be a consideration following the upcoming expansion of the European union to include countries with a large agricultural base, then the commercial sustainability of these environmentally sustainable products would surely be tested.

The Wool Research Organisation of New Zealand Inc. and its subsidiary LincLab (NZ) have a number of research programmes developing materials from renewable resources and sustainable industrial processes. For further information about these programmes please contact Dr Rob Kelly or Dr Gill Worth.

WORLD'S FASTEST ICP-OES DELIVERS UNMATCHED PRODUCTIVITY AND DETECTION CAPABILITIES



Offering unmatched laboratory productivity and measurement performance, Varian's Vista-PRO is the world's fastest ICP-OES (Inductively Coupled Plasma Optical Emission Spectrometer), two to three times faster than competing ICP systems. The top-of-the-line Vista-PRO spectrometer can analyze 73 elements in 35 seconds, with a capacity of more than 1000 samples per day. It also offers laboratories a significant reduction in argon consumption, dramatically reducing operational costs. Vista-PRO addresses the needs of environmental, geochemical, clinical and contract laboratories managing heavy workloads.

The newest Varian ICP offers full wavelength coverage from the unique VistaChip CCD detector, which can detect any elemental wavelength from 167 to 780 nm. This enables the Vista-PRO to detect low levels of elements and very high levels of elements simultaneously. For example, Vista-PRO users can measure parts-per-billion levels of lead at the same time as they measure up to percentage levels of elements such as calcium, potassium and sodium. Key to the performance of the Vista-PRO is a new suite of instrument control and measurement software applications, including time-resolved software for speciation, a powerful reporting engine for real-time, direct interfacing to Microsoft Word and Excel applications, real-time reference standard tracking and tools for GALP/CFR-21 compliance.

Contact: Graeme Sawyer, Ai Scientific, Freephone: 0800 951010, Email: graeme.sawyer@aiscientific.com
circle number 21 on the reader reply card

VARIAN DEBUTS BREAKTHROUGH UV-VIS-NIR SPECTROPHOTOMETER

Meeting the demanding measurement requirements of fibre optics and other advanced telecommunications applications, Varian, Inc. has introduced the Cary 500i, the world's first commercially available UV-Vis-NIR spectrophotometer to use an InGaAs (indium gallium arsenide) detector. As a result, the Cary 500i boasts detector performance up to ten times better than existing technology, and offers the highest photometric capabilities of any large-scale commercial doublebeam spectrophotometer.

Superior InGaAs detector performance gives the Cary 500i the ability to characterize modern broadband telecommunications system components requiring photometric measurements over the entire 800 nm to 1700 nm wavelength range. Such performance parameters are required for critical fibre optic development processes including characterization of beam splitters and WDM (wavelength division multiplexing) optical filters found in modern telecommunications networks. The InGaAs detector provides significantly increased sensitivity at infrared wavelengths when compared to that available with standard lead-sulfide detectors. Superior performance is possible because of the InGaAs detector's improved signal-to-noise ratio. This enables greater limiting resolution measurements, making it possible to characterise samples with narrower NIR spectral features, such as narrow bandpass filters.

"The top-of-the-line Cary 500i asserts Varian's commitment to providing high performance spectrophotometry solutions for fast-growing markets such as telecommunications," said Greg Davis, Vice President and General Manager of Varian, Inc.'s spectroscopy instruments business. "The unparalleled performance of the Cary 500i will prove invaluable to these leading-edge technology developers and enable continued innovation in their own industries."

The superior infrared detector performance of the Cary 500i also enables laboratories to set faster scan rates. As a result, researchers can obtain data of equal quality to lead-sulfide detectors in a fraction of the time.

Varian, Inc. will also introduce a new near-normal absolute specular reflectanc accessory. This accessory is designed to measure low reflectance samples such as anti-glare coatings at less than 0.1%R. This absolute measurement capability eliminates the need for certified standards.

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circle number 22 on the reader reply card

AGILENT TECHNOLOGIES INTRODUCES NEW 7500C ICP-MS SYSTEM THAT EXTENDS ICP-MS ANALYSIS CAPABILITY

Agilent Technologies Inc., has introduced its new Agilent 7500c inductively coupled plasma mass spectrometer (ICP-MS). The 7500c ICP-MS is designed for the analysis of samples that cannot be addressed using current quadrupole ICP-MS technology.

The 7500c ICP-MS, with its simultaneous multi-element capability, high sample throughput, and part-per-trillion sensitivity, will be a key analytical tool for laboratories performing trace metals analysis in complex samples.

Agilent 7500c ICP-MS Octopole Reaction Cell
To overcome interferences that cannot be resolved using quadrupole technology, the 7500c uses an octopole reaction cell. During the analysis, the interfering species are dissociated by a reaction gas within the cell, eliminating the interference and enabling the analyte to be determined. The Octopole Reaction System (ORS) employs "soft" or moderately reactive gases that virtually eliminate the potential for complications from side reactions. In addition, the passive ORS requires no optimization of scanning voltages and its modular configuration is easily removed for maintenance by the user.

Along with the 7500c ICP-MS system, Agilent will be introducing the first commercial GC-ICP-MS interface for performing trace metal speciation of volatile compounds such as organotins and a 7500 Series mainframe-integratable clean autosampler designed for contamination free sampling and transport prior to low level metals analysis.

The 7500c is the latest addition to the range of Agilent ICP-MS solutions which include:
- the Agilent 7500a - a full performance, benchtop ICP-MS system suitable for analysis of a wide variety of sample types;
- the 7500i - which extends 7500a performance with "intelligent" sample dilution and QC productivity software suited to the needs of the high throughput contract laboratory; and
- the 7500s - which meets demanding semiconductor analysis requirements using Agilent's ShieldTorch technology.

Contact: Peter Hermans, Medtec Products Ltd
P O Box 34-241 Birkenhead, Auckland
Phone: (09) 4791068, Fax: (09) 4791450
Email: phermans@medtec.co.nz
circle number 23 on the reader reply card

AGILENT TECHNOLOGIES' ENVIRONMENTAL SEMINAR ON FOOD & AGRICULTURAL ANALYSIS TO TOUR IN JULY

Agilent Technologies has announced that throughout July it will tour a seminar that addresses analytical problems in the food and agricultural industries. Entitled "New Analytical Methods and Technologies for Food and Agricultural Analysis," the seminar features two renowned speakers: Chuck Stafford, Manager of the US EPA Pesticide Analysis, Regulation and Registration Program Office, and Stuart Cram, Worldwide Business Development Manager of Agilent Technologies.

Both speakers will travel to seven countries from July 5-23, covering topics on HPLC, LC-MS, food, soil, water and agriculture methods and analyses as well as the role of CODEX, FDA and EPA. Chemists in the industry, research institutes, government, universities, monitoring stations and independent testing laboratories with applications in pesticides, herbicides, fungicides, and sulfonyl will benefit from this seminar.

The seminar is free of charge

For registration or more information, please contact the following local Agilent offices.

Seminar Date	Country
Thursday, July 19	Australia - Sydney
Friday, July 20	- Melbourne
Sue Broughton Tel : 1800 802 402 Fax : +61 2 98056301	
Monday, July 23	New Zealand – Auckland
Julie Henderson Tel : +64 9 4791068 Fax : +64 9 4791450	

Advertiser's Index

New Initiatives In Chemical Measurement

Marcus Krapp
Measurement Standards Laboratory of New Zealand
Chemical Metrology, PO Box 31-310, Lower Hutt, Email: m.krapp@irl.cri.nz

Prologue

In 1989 the entire grape crop of a South American country was rejected for import into the USA, based on an inadequate measurement of cyanide. Minute traces of cyanide were reported by a US laboratory, and consequently, the US, Canada, Japan, Denmark, Germany and Hong Kong all suspended fruit imports from that country, and existing stocks were ordered pulled from grocery shelves. The resulting law suit claims are around US$ 400M, and it is estimated that the loss in fruit exports, suffered as a result, were up to US$ 1billion.

Introduction: Modern trade developments

The times when nations used protective duties and tariffs to shield their economy against second party goods are rapidly passing. The modern international trade of open marketplaces now uses the instrument of setting specifications for products and services to open or close markets. The totality of characteristics of an entity that bear on its ability to satisfy stated and implied needs, is defined as *quality* [1]. Whatever the reasons, that lead to a predefinition of characteristics for a product, the exporters goal is to meet these quality criteria, to gain access to the markets.

However, achieving conformance by meeting these characteristics and fulfilling the quality criteria are only half of the admission ticket to markets. The international drive for the liberalisation of trade between countries also relies on mutual recognition of the quality of goods and services being traded. The verification of conformance with specifications is as important as the underlying ability to manufacture products and to provide services to the defined requirements, and this is the other half of the ticket.

Modern trading agreements require countries to have an appropriate measurement infrastructure to meet standards and conformance requirements, and facilitate equity in trade. Accordingly, the quality of traded products and the verification of the conformance should be ensured through an appropriate level of technical infrastructure within each country. In the Agreement on Technical Barriers to Trade (TBT), the World Trade Organization (WTO) recognises the need for each country, to establish its own infrastructure in such a way, that there is external confidence in the quality of goods [2]. The key to that external confidence is systems to demonstrate comparability of measurement results, obtained in different (national and international) laboratories, with comparability understood as the ability to assess the similarity of two or more measurement results.

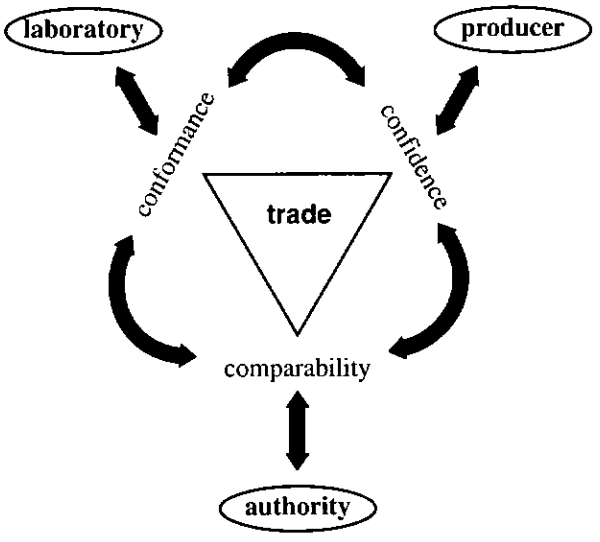

Figure 1: *Components of modern trade*

Accordingly, future trade relations depend on demonstrated *confidence in conformance through comparability* (Fig. 1). This is not the business of any single producer, laboratory, or authority and board. New Zealand will only succeed in future international trade, if every party fulfils its part of the whole.

The well-informed reader knows where to find his place in that picture and what his part may be. This article describes the activities of the Measurement Standards Laboratory of New Zealand (MSL), to improve the technical infrastructure for chemical measurements within New Zealand.

Problem: International demands and New Zealand's present position

During the last ten years, great effort has been made on an international level, to develop a metrological base for chemical measurements. However, this endeavour is still far behind that in physical metrology.

International developments
Besides the above-mentioned TBT, the Asia Pacific Economic Co-operation (APEC) calls on the developed countries, to sign a full trade agreement in 2010 (or by 2020 for the developing countries). An essential first step is, to mutually recognise their measurement standards as a part of the general recognition of the standards and conformance infrastructure. This recognition must be complete well in advance of the main agreement, as it is the corner stone for the measurement conformance

infrastructure. The national measurement institutes under Asia Pacific Metrology Programme (APMP) are starting to carry out the necessary measurement comparisons, exchange of personnel and training, to meet the objective of mutual recognition for the developed countries. New Zealand has not yet been able to take full part in this programme through lack of resources.

Looking at other parts of the world, the United States of America established in 1901 the National Bureau of Standards, now the National Institute of Standards and Technology (NIST). It has an annual budget of about US $800 million and employs about 3,330 people. The Countries of the European Community established in 1960, besides their national activities, the Institute of Reference Materials and Measurements (IRMM) as a joint research centre with approximately 250 staff, and in 1997 Australia established the National Analytical Reference Laboratory (NARL). All these institutions were founded with similar aims: i.e. to strengthen the national economy and to ensure the quality of commercial products, to develop and perform standard test methods and reference measurements, to produce certified reference materials, to organise international measurement evaluation programs, and to carry out prenormative research and basic science. All these activities in entirety form the higher-level technical infrastructure, to ensure comparability and to demonstrate competence, that finally leads to international confidence. These activities show that in other parts of the world the consequences of international agreements and the demands of international trade have already been recognised and consequently, programs to fulfil these challenges have been started. In these countries, it has already been realised that mutual recognition of measurement results, and the avoidance of costly disputes, require the development of a structured and common system of measurement.

International demands

A lot of the activities on the international stage may seem to be far away and possibly quite abstract or strange. What are the consequences of these developments for people performing measurements and producing measurement results? The answer is quite simple, though the solution will be unexpectedly difficult: all measurement results yielded in a New Zealand laboratory (in context with international trade) have to be made comparable to results gained in another (international) laboratory. That still sounds easy, just measure the content of an analyte in a sample and see if the other laboratory gained the same result. However, if you have repeated a measurement on another day or on another machine, you know that it is not that easy at all. "Never repeat a successful measurement" is an aged saying among laboratory staff. If it is a problem to compare results in the same laboratory, it is of course much more difficult to compare results of different laboratories.

However, this problem is well known and there are tools to achieve comparability and demonstrate competence. The traceability concept has been developed by (chemical) metrologists to ensure comparability of results at all stages. "Traceability is the property of the result of a measurement or the value of a standard whereby it can be *related to stated references*, usually national or international standards, through an *unbroken chain of comparisons*, all having *stated uncertainties*" [3].

Accompanying this scientific approach, which emphasises numerical links to the stated references, there is a procedural and administrative approach, i.e. the accreditational system. Accreditation ensures that laboratories operate an appropriate quality system, are technically competent, follow appropriate technical procedures, and are capable of generating technically valid results.

The comparability of chemical measurement results can only be achieved by using the concept of traceability. Traceability to a common defined reference point provides a quantitative measure of quality, a basis for fitness for purpose and a basis for cost-benefit analysis. The level of traceability required should be driven by the use to which results are being put. As the introductory example shows, high cost can be incurred by making poor decisions based on data of inadequate reliability. Improved measurement uncertainty can demonstrate better control of the whole process, and lead to cost reductions in manufacturing processes and in pollution control. At the other extreme, unnecessarily high quality measurements cause avoidable cost. However, the establishment of the traceability concept is not only an issue for individual laboratories, it requires a high-level infrastructure.

The importance of traceability for New Zealand is highlighted by the recent release of the new ISO/IEC 17025 [4], which is now the reference document on which accreditation of laboratories is based. Here a strong recommendation for the maintenance of quality control procedures, for monitoring the validity of tests and calibrations undertaken, is underlined. These procedures may include regular use of certified reference materials and/or internal quality control using secondary reference materials, participation in inter-laboratory comparison or proficiency-testing programmes. This is nothing new to New Zealand laboratories, as the same recommendations are given in the New Zealand Code of Laboratory Management Practice [5]. However, the ISO/IEC 17025 reflects an increased international demand for those quality control procedures, as they form the basis for worldwide quality assurance in analytical laboratories.

Consequently, international demands to New Zealand are the fulfilment of the criteria of the traceability concept (and the requirements according to ISO/IEC 17025 if a laboratory is or is asked to be accredited). The practical implementation requires mainly the calculation of a measurement uncertainty budget, the usage of reference materials and methods, the participation in proficiency programmes like inter-laboratory comparisons (ILC) or proficiency testing schemes (PTS), and the availability of extensive knowledge. All together this leads to international confidence through demonstrated competence.

New Zealands present position

So what is the situation like regarding references and

proficiency programmes in New Zealand? At the moment, there is no central source of information about the needs and requirements for references and proficiency programmes available. Some information is available from International Accreditation New Zealand (IANZ) and other from industry groups. Others are found by chance. Most laboratories know of sources for reference materials like NIST or IRMM, but there are many more, often less or not at all known. Almost all reference materials are bought overseas. In the case of soil and biological animal materials, this is often troublesome as biosecurity controls cause additional paper work to get the special permit from the Ministry of Agriculture and Forestry (MAF). These problems of identifying sources, purchasing overseas and high prices discourage laboratories from purchasing reference materials as often as they should. Furthermore, there are very few New Zealand laboratories that manufacture certified reference materials, and it is not clear if there is a need for (certified) reference materials restricted to local New Zealand problems, which would not be available from overseas anyway. Some New Zealand laboratories do take part in international proficiency programmes, but due to high fees and again the difficulties of importing sample materials because of biosecurity controls, others may have been discouraged. Accredited laboratories have always been required to demonstrate some external comparability of their measurements, one method for doing so being proficiency testing. Rationalisation is decreasing the number of participants, so that even national proficiency programmes, such as organised by the Dairy Board, may be making some of these programmes marginal. Possibly some of the laboratories regard proficiency programmes more as a control of their work and a nuisance than as an opportunity to review the quality of their work and for bench marking.

In summary, New Zealand laboratories probably make less use of (certified) reference materials and proficiency programmes than those in Europe and the US. They do make extensive use of materials to control their analytical process, but systems to demonstrate traceability to international reference points are often lacking. But it should be mentioned again, that Europe and the US, which are the main markets for the New Zealand export industries, are setting the requirements and criteria for incoming goods.

The isolation of New Zealand is a major factor inhibiting development. We have low awareness of the international changes and trends until recently there were no plans to maintain a formal national infrastructure for measurement standards in chemistry, as we do for the other physical measurement standards (provided by MSL).

Contrast that with countries like the US, European Countries or Australia, which push large amounts of money into the establishment of such a formal infrastructure. They have already realised the enormous importance of this issue. Clearly if New Zealand is to take advantage of the trade liberalisation, it will need to develop an appropriate infrastructure for the chemical measurements, if other countries are to recognise these measurements. The ability to trade is the ability to measure in conformance.

Consequences: MSL activities

The Measurement Standards Laboratory of New Zealand has recognised the international demands on trading countries to have an appropriate measurement infrastructure. Consequently, MSL, as the national metrology institute, has started a new initative, to develop a high-level measurement infrastructure for chemistry. Although the main purpose for introducing chemical metrology into New Zealand is to meet international trade demands, there will also be considerable benefit to science and technology through improved measurements. There are three basic requirements for chemical traceability in order to achieve this purpose:

1. Transparency and coherency in the traceability of chemical measurements in New Zealand,
2. Recognition of the traceability of chemical measurements from other countries, and
3. Confidence in the traceability of chemical measurements in New Zealand.

These requirements are the same for any other measurement and therefore, the same well-established system can be used to satisfy them. This is achieved through the New Zealand Measurements Standards Act 1992 [6], which appoints MSL to be responsible for the SI measurement units. The Act already includes the mole, even though no provision is currently made for its realisation. Therefore, the responsibility for chemical measurement traceability remains with MSL, because this meets the first two requirements and matches international expectations.

The transparency and coherency of measurement traceability is achieved by having one organisation responsible for the SI in New Zealand. That is, a user only has to deal with one organisation for authoritative interpretation of traceability requirements.

Recognition agreements on measurement traceability between countries will be with single organisations in each country. Where countries have two or more organisations involved, then one has to be empowered to sign on behalf of the others, or alternatively, they would need to establish an umbrella organisation.

Confidence in the traceability of chemical measurements in New Zealand will need to be demonstrated. It is important that an analytical laboratory is established with a substantive research and development component, to provide for confidence in chemical traceability. Such a laboratory will provide the technical leadership, to ensure that chemical measurements in New Zealand meet increasingly rigorous technical requirements, arising from trade. Participation in international chemical measurement comparisons by New Zealand laboratories will be a priority concern.

Procedure: From demands to realisation

MSL is focusing its activities on four issues, i.e. *reference materials*, *reference methods*, *inter-laboratory*

comparisons/proficiency testing schemes, and *general information* regarding chemical metrology and quality assurance in (chemical) laboratories. The strategy is divided into three phases (Fig. 2). In the first phase, as much information as possible is being collected, and will form a reliable basis for further developments and activities. In the second phase, databases will be set up and maintained to provide New Zealand's laboratories with information, to help them to establish traceability in their laboratories. In the third phase, new (certified) reference materials and reference methods, currently not available on the market, will be developed and established. MSL has already started building the databases, so limited information will be available soon for the short-term benefit for clients. Depending on the respective problems, it should be possible for New Zealand laboratories, to establish traceability from somewhere in the second phase on.

With regard to the *reference materials*, initially it has to be ascertained which reference materials relevant for New Zealand are available on the market, and what the requirements are for materials not currently available. This will also answer the question about the necessity for reference materials for local New Zealand problems, unlikely to be available from overseas anyway. The information gained in this phase will be used to set up a database, which will provide information about manufacturer, purchase prices, quality, availability etc. of reference materials, which would simplify the work for laboratories, looking for certain reference materials. Furthermore, this inquiry will reveal the gaps in the availability of reference materials, that in turn will form the starting point for the projects of phase three, the development and manufacture of materials in New Zealand.

A similar database will be set up for *reference methods*. Again an initial review will provide information about reference methods already in use and available, and where a potential for new developments might be. New Zealand has to build up primary measurement capability, and these materials and methods databases complement each other in establishing the traceability chain.

The creation of a third database on *inter-laboratory comparisons and proficiency testing schemes* is essential for the establishment of a technical infrastructure for chemical metrology. As certified reference materials and methods are currently not available for many analytical problems, proficiency programmes offer a third possibility for establishing comparability with other laboratories. Once more a survey will establish an overview of national and international activities, that will be the basis for New Zealand's future activities, to provide a convenient source of information for laboratories intending to take part in proficiency programmes.

A fourth database will be set up by MSL regarding more *general information* of relevance to chemical metrology and quality assurance in analytical chemistry. In other parts of the world, chemical metrologists are at least one step ahead of their colleagues in New Zealand, working on the establishment of traceability and comparability. There is much information already available, which will be collected in this database and placed on the World Wide Web. It will be a source for basic or advanced information, as it will comprise relevant literature, guides and documentary standards. As it will also include an index of organisations and institutions present on the World Wide Web, it may also be the starting point for laboratories further investigations.

MSL will also offer basic and advanced training courses, to support people wishing to broaden their knowledge and experience, regarding modern analytical quality assurance. In this context it is worth mentioning, that in the long run New Zealand's integration and involvement in the international scientific community will only be accepted, if New Zealand has knowledge to offer in return. Consequently, New Zealand has to gain knowledge for participation in international developments. Therefore, a system for promotion and marketing of New Zealand developed reference materials and reference methods, or New Zealand launched ILC and PTS, has to be established, once these are developed and available. An initial step to enter the network of international collaboration in chemical metrology will be the development of an Australian/New Zealand collaboration, which has already been proposed [7].

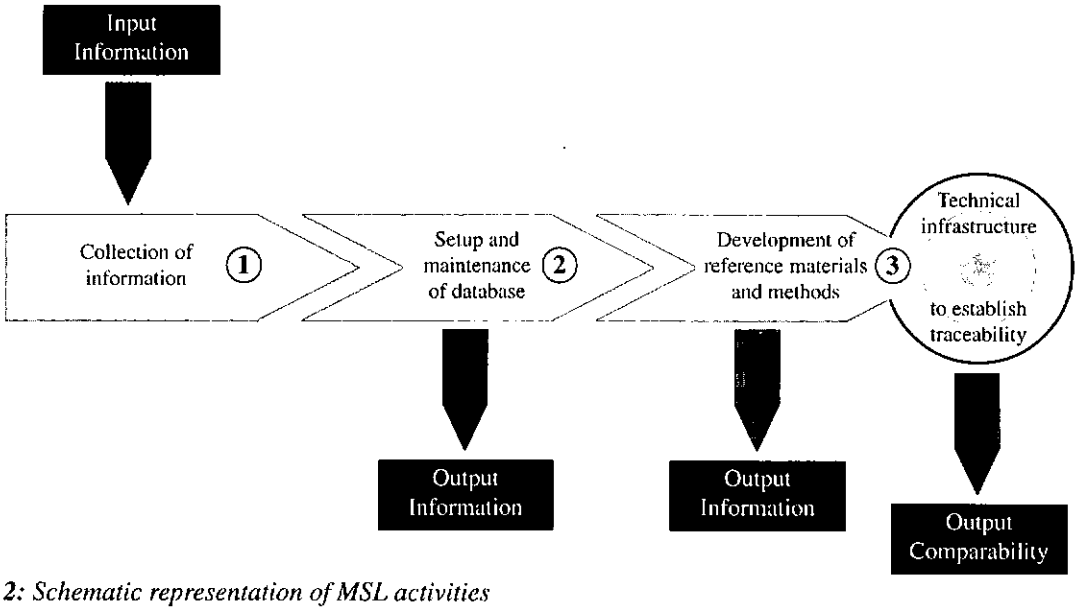

***Figure 2:** Schematic representation of MSL activities*

Your part: Invitation for contribution and discussion

The first phase of MSL activities involves the collection of information, to gain an extensive overview and a sound basis for the subsequent steps. This depends on the collaboration of as many laboratories and clients as possible, to gain a representative profile of New Zealand's state of affairs. MSL has developed a **questionnaire** to collect the necessary information, and to offer a first forum for contributions, discussions and expression and formation of opinion. This questionnaire was distributed by postal mail. MSL is setting up a database of chemical laboratories in New Zealand, which at present is very incomplete. To reach more laboratories, the questionnaire is available on the MSL website, it can be downloaded under http://www.irl.cri.nz/msl/chemsta.htm

The site contains further information on chemical metrology and contact points, which may be of interest. MSL, as national metrology institute, is committed to a totally impartial and independent role. It is also aware of the commercial sensitivity of much of the chemical analysis work, and will keep information confidential.

The setting up of a formal infrastructure, to establish traceability in New Zealand, is a huge challenge and great efforts from producers, laboratories and authorities will be necessary to realise the demanding goal. Therefore, MSL kindly requests and invites contributions, large or small, from those who can help, to promote and strengthen New Zealand's position in worldwide trade and chemical measurements. This is a project of national collaborative interest.

Epilogue

New Zealand and Europe have traditionally used different analytical methods to determine fat in butter, with the New Zealand method tending to produce a lower result. It is well known that this difference led to a claim in Europe of non-compliance against their customs requirements and the short term imprisonment of the company executives involved, and costs of many millions of dollars. The development of an agreed reference method for fat in butter would have eliminated this lack of international comparability in fat measurement together with its consequences.

Acknowledgements

The author is indebted to Dr J L. Love (Institute of Environmental Science & Research Lmited, Christchurch) for contributing very useful information to this article and to the chemical metrology programme of MSL.

Literature

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[6] The New Zealand Measurements Standards Act 1992.

[7] CITAC Newsletter, February 1999 (http://www.vtt.fi/ket/citac/nl9901.htm).

Further very useful literature

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B King, Traceability of Chemical Analysis, *Analyst.* (1997). **122**: 197-204.

EURACHEM/CITAC-Guide "Quantifying Uncertainty in Analytical Measurement", Second Edition, Draft (1999), (http://www.vtt.fi/ket/eurachem/publications.htm).

About The Author

Marcus Krapp is an analytical chemist with experience in environmental analytical chemistry, laboratory quality assurance, chemical metrology and chemical education. He was involved in activities of EURACHEM/D and the Hermann von Helmholtz Association of German Research Centres (HGF) in issues of chemical metrology. He is a member of the Chemical, Biological and Dairy Professional Advisory Committee at International Accreditation New Zealand (IANZ).

CONFERENCES & SEMINARS

25-26 July 2001

Global Bioactives Summit

Venue: Novotel Tainui Hotel, Hamilton, New Zealand
Contact: Rosemary Cleland
Tel: (+64-6)-3587155
Email: h.r.cleland@xtra.co.nz
Website: www.agresearch.co.nz/conference/bioactives

28 July-1 August 2002

17th Biennial Conference on Chemical Education

Venue: Bellingham, Washington, USA
Contact: George S Kriz, General Chair, 17th BCCE
Department of Chemistry, MS 9150
Western Washington University
Bellingham, WA 98225, USA
Tel: (+1-360)-6503126
Email: bcce@chem.wwu.edu.
Website: *//atom.chem.wwu.edu/acs/bcce2OO2.htm/*

29 July 29-2 August 2001

ChemEd 2001

Venue: Toronto, Ontario, Canada
Contact: Email: chemed@yorku.ca
Website: *www.science.yorku.calchemed2001*

12-17 August 2001

Queenstown Molecular Biology Meeting

Venue: Queenstown, New Zealand
Contact: Ms Billie Masters
Masters Conference Management
Tel: (+64-3)-4777754
Fax: (+64-3)-4777757
Email: jmasters@es.co.nz

18 - 23 August 2002

17th International Conference on Chemical Education

Venue: Beijing, China
Contact: The Secretary, Professor Xibai Qui
Tel/Fax: (+86-10)-62568157
Email: qiuxb@infoc3.icas.ac.cn
Website: www.ccs.ac.cn/17icce.htm

26-30 August 2001

222nd American Chemical Society Meeting

Venue: Chicago, Illinois, USA
Contact: ACS Meetings, 1155 Sixteenth Street, NW
Washington DC 20036-4899, USA
Tel:(+1-202)-8726059
Fax:(+1-202)-8726128
Email: natlmtgs@acs.org
Website: Web: *www.acs.orglmeetings*

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 90040 Auckland, New Zealand
Tel: (+64-9)-3601240
Fax: (+64-9)-3601242
Email: info@tcc.co.nz
Website: www.iups2001.org.nz

4 & 5 September 2001

Stainless Steels In The Engineering & Manufacturing Industries - The Questions Most Commonly Asked About Stainless Steels

Venue: HERA House, Gladding Place, Manukau
Auckland, New Zealand (September 4)
Dalmiur House, 114 The Terrace
Wellington, New Zealand (September 5)
Contact: HERA
Tel: (+64-9)-2622885
Fax: (+64-9)-2622856
Email: admin@hera.org.nz

11-13 September 2001

Society For General Microbiology, 149th Ordinary Meeting: Mycobacteria - New Developments

Venue: Norwich, England, UK
Contact: J Dunn, Meetings Administrator, SGM
Fax: (+44-118)-9885656
Email: meetings@sgm.ac.uk
Website: http://www.sgm.ac.uk

14-16 September 2001

Fourth International Congress On Peer Review In Biomedical Publication

Venue: Barcelona, Spain
Contact: J Smith, BMJ Publishing Group
Fax: (+44-20)-73836418
Email: jsmith@bmj.com

23-27 September 2001

6th World Congress Of Chemical Engineering

Venue: Melbourne, Victoria, Australia
Contact: Congress Secretariat
The Meeting Planners
91-97 Ishlington Street
Collingwood, VIC 3066, Australia
Website: www.chemengcongress.com

29 October 2001

Measuring Up - A Symposium On Calcium's Contribution To Bone Health

Venue: Carlton Hotel, Auckland, New Zealand
Contact: Andrea Patterson
New Zealand Milk
Tel: (+64-4)-4628062
Email: dairyhealth@newzealandmilk.com
Website: www.newzealandmilk.com

30-31 October 2001

Agrobusiness Congress

Venue: Christchurch, New Zealand
Contact: Jan Latham
Email: lathamj@lincoln.ac.nz

CONFERENCES & SEMINARS

30 October-1 November 2001

Fresh Perspectives On Bioactive Dairy Foods - Opportunities And Challenges For Health, Marketing and Technology

Venue: Carlton Hotel, Auckland, New Zealand
Contact: Andrea Patterson
New Zealand Milk
Tel: (+64-4)-4628062
Email: dairyhealth@newzealandmilk.com
Website: www.newzealandmilk.com

30 October-2 November 2001

CIA 2001. Comprising CHEMASIA 2001, INSTRUMENT ASIA 2001, ANALABASIA 2001

Venue: Singapore

18-21 November 2001

Corrosion & Prevention 2001 - Durability Of Materials

Venue: Conventions on King, Newcastle
New South Wales, Australia
Contact: Sally Nugent
P O Box 634, Brentford Square
VIC 3131, Australia
Tel: (+61-3)-98740800
Fax: (+61-3)-98744800
Website: www.corrprev.org.au

December 2001

675th Biochemical Society Meeting

Venue: Warwick, England, UK
Contact: The Meetings Office
The Biochemical Society
59 Portland Place, London W1B 1QW
England, UK
Fax: (+44-20)-76377626
Email: meetings@biochemistry.org
Website: http//:www.biochemistry.org

4-7 December 2001

"Molecules For Life" 2001 NZIC, NZSBMB, NZBA Conference

Venue: War Memorial Centre, Napier, New Zealand
Contact: Stan Moore
Massey University
Email: s.moore@massey.ac.nz
Website: http//:hort.cri.nz/nzic

27 January - 1 February 2002

The Dynamics of Ribosome Structure and Function - Triennial International Ribosome Conference

Venue: Rydges Hotel, Queenstown, New Zealand
Contact: Billie Masters
516 George Street, Dunedin, New Zealand
Tel:(+64-3)-4777754
Fax: (+64-3)-4777757
Email: billie@jsmasters.co.nz
Website: http://biochem.otago.ac.nz/ribocon/

30 June - 5 July 2002

18th International Cancer Congress

Venue: Oslo, Norway
Contact: Congress Secretariat, Congrex Switzerland
SA, 3, rue du Conseil-General
1205 Geneva, Switzerland
Fax: (+41-22)-8091874

24-27 September 2002

3rd World Congress On Emulsions

Venue: Lyon, France
Contact: CME
50 Place Marcel Pagnol
92100 Boulogne-Billancourt, France
Tel: (+33-1-)-47617689
Fax: (+33-1-)-47617465
Email: alain.lecoroller@wanadoo.fr
Website: www.cme-emulsion.com

14-17 July 2002

ICOS-14 14th International Conference on Organic Synthesis

Venue: Christchurch, New Zealand
Contact: Professor Margaret Brimble
Department of Chemistry
University of Auckland
Private Bag 91029, Auckland, New Zealand
Fax: (+64-9-)-3737599 ext 8259
Fax: (+64-9-)-3737422
Email: am.brimble@auckland.ac.nz
Website: www.conference.canterbury.ac.nz/icos14

20-25 October 2002

28th Meeting of the Federation of European Biochemical Societies; Jerusalem

Venue: Israel
Contact: Conference Secretariat
28th International Conference
P O Box 50006, Tel Aviv 61500, Israel
Website: www.kenes.com/febs

ICOS-14
14th INTERNATIONAL CONFERENCE ON ORGANIC SYNTHESIS

Christchurch, New Zealand, July 14-18, 2002
http://www.conference.canterbury.ac.nz/icos14

Professor Margaret A Brimble (University of Auckland), Professor Jim Coxon (University of Canterbury)
Co-Chairs Organising Committee

Every two years IUPAC sponsors an international conference on organic synthesis. This conference is one of the premier conferences on synthetic organic chemistry and will be well attended by organic chemists from around the world. We are therefore pleased to advise that most of the preliminary arrangements have been finalised for the IUPAC 14th International Conference on Organic Synthesis (ICOS-14) which will be held in Christchurch, New Zealand on July 14-18, 2002. Please bookmark the web site: http://www.conference.canterbury.ac.nz/icos14.

Programme: Registration mixer 14 July, scientific sessions 15-18 July, optional tours Friday 19 July. Abstracts for papers will be called for in November 2001.

The conference promises a wealth of outstanding science in all aspects of modern organic synthesis. The conference will be organised around 8 plenary speakers and 20 section lecturers. The recipient of the prestigious Thieme/IUPAC Prize for Synthetic Organic Chemistry for 2002 will also present a plenary lecture. The following mini-symposia are also planned:

A. Synthesis of Bioactive Molecules (*Chair:* Professor Bill Kitching, Australia)
B. Combinatorial Chemistry (*Chair:* Dr Chris Litten, Sweden)
C. Stereoselective Synthesis (*Chair:* Dr Vittorio Caprio, New Zealand)
D. Green Chemistry (*Chair:* Dr Paul Anastas, USA)
E. Metal Mediated Synthesis (*Chair:* Dr Roderick Bates, Thailand)
F. Automation in Synthesis (*Chair:* Professor Junzo Otera, Japan)

The following scientists have agreed to give plenary lectures at ICOS-14:

Jonathan A Ellman, University of California, Berkeley, USA.
Ben L Feringa, University of Groningen, the Netherlands.
Tohru Fukuyama, University of Tokyo, Japan.
Yoshito Kishi, Harvard University, USA.
Stephen F Martin, University of Texas at Austin, USA.
Koichi Narasaka, University of Tokyo, Japan.
Albert Padwa, Emory University, USA.
William R Roush, University of Michigan, USA.
Thieme / IUPAC Award Lecture, to be announced.

The following scientists have agreed to give section lectures at ICOS-14:

Mario D Bachi, Weizmann Institute of Science, Israel.
Charles B De Koning, University of the Witwatersrand, South Africa.
Alessandro Dondoni, University of Ferrara, Italy.
John A Gladysz, University Erlangen-Nuernberg, Germany.
Laurence M Harwood, University of Reading, United Kingdom.
Masahiro Hirama, Tohoku University, Japan.
Tsutomu Katsuki, Kyushi University, Japan.
David W Knight, Cardiff University, United Kingdom.
Mieczyslaw Makosza, Polish Academy of Sciences, Poland.
Lewis N Mander, Australian National University, Australia.
Goverdhan Mehta, Indian Institute of Science, Bangalore, India.
Johann Mulzer, University of Vienna, Austria.
Philip J Parsons, University of Sussex, United Kingdom.
Mark Rizzacassa, University of Melbourne, Australia.
Toshiaki Sunazuka, Kitasato University, Japan.
Keisuke Suzuki, Tokyo Institute of Technology, Japan.
Lutz F Tietze, University of Gottingen, Germany.
Peter Wipf, University of Pittsburgh, USA.

NATIONAL ORGANISING COMMITTEE

Co-Chair: Professor Margaret A Brimble (University of Auckland)
Co-Chair: Professor Jim Coxon (Co-Chair, University of Canterbury)
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Committee Members: Dr Vittorio Caprio (University of Auckland), Dr Carol M Taylor (Massey University)
Conference Manager: Mrs Margaret Brown (Conference Office, University of Canterbury)

Scientific Secretariat - Professor Margaret A. Brimble, Department of Chemistry, University of Auckland, Private Bag 92019 Auckland, New Zealand. Phone: +64 9 3737599 ext 8259; Fax: +64 9 3737422; Email: m.brimble@auckland.ac.nz
Conference Secretariat - Conference Office, University of Canterbury, Private Bag 4800, Christchurch, New Zealand. Phone: +64 3 364 2534; Fax: +64 3 364 2057; Email: icos@cont.canterbury.ac.nz

Using THERMAL DESORPTION - GAS CHROMATOGRAPHY for the detection of fire accelerants in arson residues

PerkinElmer Instruments, 761 Main Avenue, Norwalk, CT 06859-0010, USA

Introduction

When fires occur under suspicious circumstances, forensic scientists will normally examine the fire residue for the presence of flammable fluids such as gasoline that would indicate the deliberate creation of that fire.

Liquids such as gasoline comprise a mixture of hundreds of hydrocarbon components. Gas chromatography of these complex mixtures produces highly detailed chromatograms that are characteristic of a particular sample. Although many of the volatile components will be lost during the fire, sufficient less-volatile components may have been left in partially burned wood or other materials to enable the detection and identification of the fire accelerant from its chromatographic "fingerprint".

The extraction and concentration of the residual fire accelerant components from fire residue and their introduction into a gas chromatograph may be performed in a number of ways but normally using liquid or thermal desorption - In this paper, a method is described that uses thermal desorption - gas chromatographic (TD-GC) instrumentation to perform the extraction and analysis automatically.

Sample Preparation

A piece of seasoned pinewood was cut up into pieces approximately 2 cm x 2 cm x 20 cm. Five of these were placed in a metal tray and 10 mL of fire accelerant was poured over them. The wet wood was allowed to stand for 5 minutes and was then ignited with a burning match. When the excess liquid had burned or evaporated and the wood was partially charred, the fire was quenched by placing a metal sheet over the tray to seal out the air.

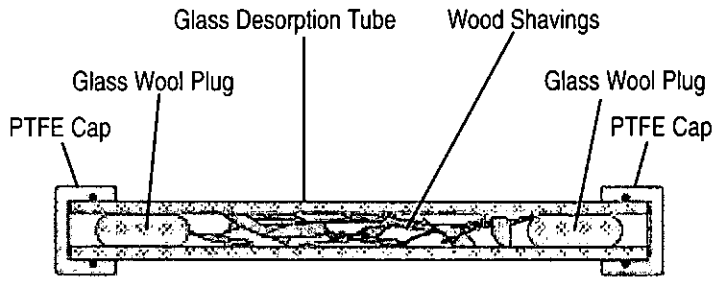

Figure 1: Glass thermal desorption tube packed with wood shavings ready for analysis.

Table 1. Conditions Used for the Determination of Residual Fire Accelerants in Wood.

Chromatograph	PerkinElmer AutoSystem XLTm Gas Chromatograph
Column	30 m x 0.32 mm x 0.25 Nm PE-1 (dimethylpolysiloxane)
Oven	40 °C for 1 min, then 5 °C/min to 240 °C, then 20 °C/min to 300 °C and hold for 5 min
Detector	Flame Ionization at 300 °C Air = 450 mL/min H2 = 45 mL/min Range x1 Attenuation x64
Thermal Desorber	PerkinElmer TurboMatrixT" Thermal Desorber
Trap	Tenax TA and Carbopack C in series 50:50
Carrier Gas	Helium at 7.5 psig
Tube Purge	1 min
Tube Desorb	20 mL/min at 120 °C for 10 min
Trap Low	-30 °C
Trap High	280 °C for 5 min
Inlet Split	None
Outlet Split	30 mL/min
Valve	250 °C
Transfer Line	250 °C

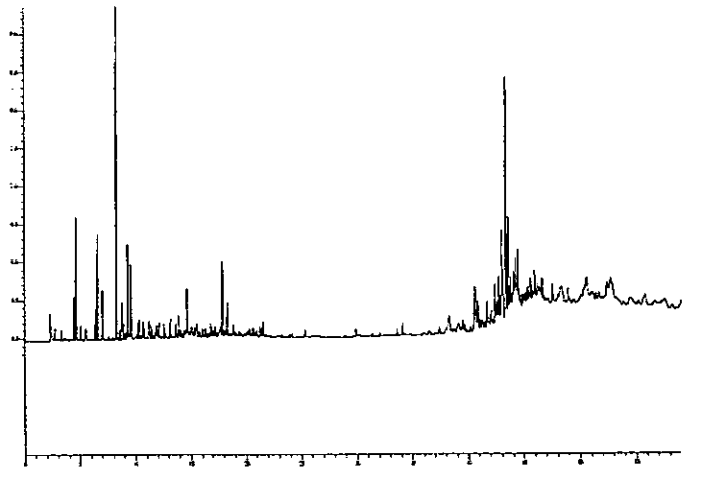

Figure 2: Chromatogram produced from wood burnt with gasoline.

The wood was allowed to cool. The charred sections of wood surface were scraped off and a sharp knife was used to shave off small thin pieces of the intact wood beneath. Fifty to sixty mg of these shavings were placed in a glass thermal desorption tube and were retained with glass wool plugs at each end as shown in Figure 1.

Two wood samples were prepared in this way using a different fire accelerant sample for each:
- 87-octane lead-free gasoline
- Kerosene

Analytical conditions

The wood sample in each tube was analyzed using TD-GC under the conditions listed in Table 1.

For reference 0.2 μL of each of the original fire accelerants was injected by syringe into a stainless steel thermal desorption tube packed with Tenax TA. Each tube was analyzed using the conditions in Table 1 except that a desorption temperature of 280 °C was applied.

Results and Discussion

Figures 2 and 3 show the chromatography obtained from the two burnt wood samples and Figures 4 and 5 show the chromatography of the original fire accelerants. Figures 6 and 7 show overlaid sections of the chromatograms to enable better comparison between the wood samples and the accelerants.

Although the early-eluting components have largely disappeared, the presence of the appropriate accelerant in each burnt wood sample is easy to detect. The background profile from the wood matrix is low because of the relatively low (120 °C) tube desorption temperatures and because the heat from the fire will have expelled most of the volatile content from the wood.

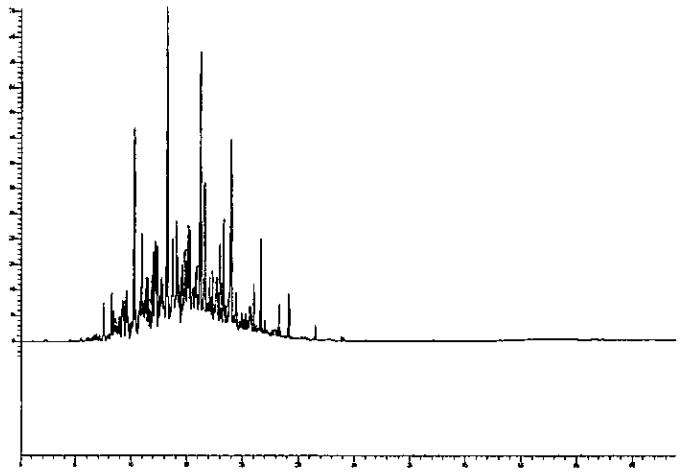

Figure 3: Chromatogram produced from wood burnt with kerosene.

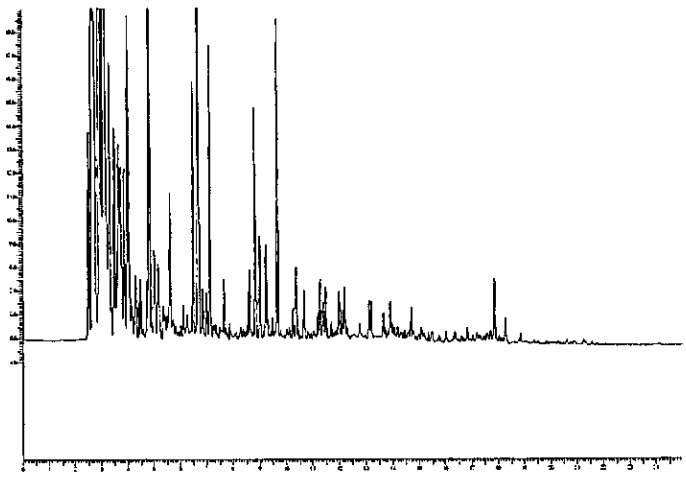

Figure 4: Chromatogram of original gasoline.

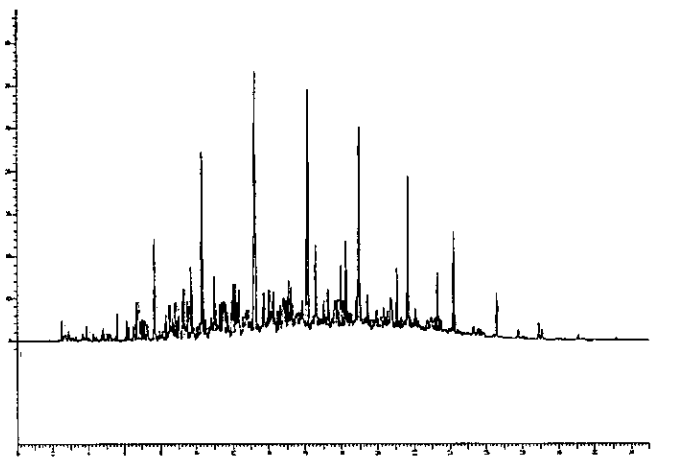

Figure 5: Chromatogram of original kerosene.

Conclusions

Although this work is by no means an exhaustive study, it does demonstrate the potential of using TD-GC in arson investigations. Good informative chromatography is produced with a minimum of effort on the part of the user.

The above application was reprinted with the permission of PerkinElmer Instruments.

For more information on the equipment used in this application ...

Contact:
Laurence Van Dam
NZ Scientific Ltd
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Auckland.
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Fax: 0800 776000
Email: perkin-elmer@clear.net.nz
Internet: www.perkinelmer.com
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instruments.

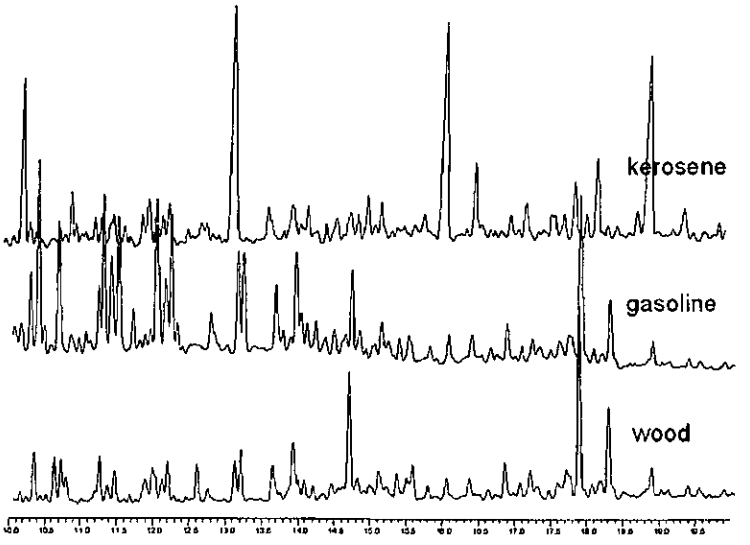


Figure 6: Comparison of section of burnt wood with the two accelerants confirming the presence of gasoline.

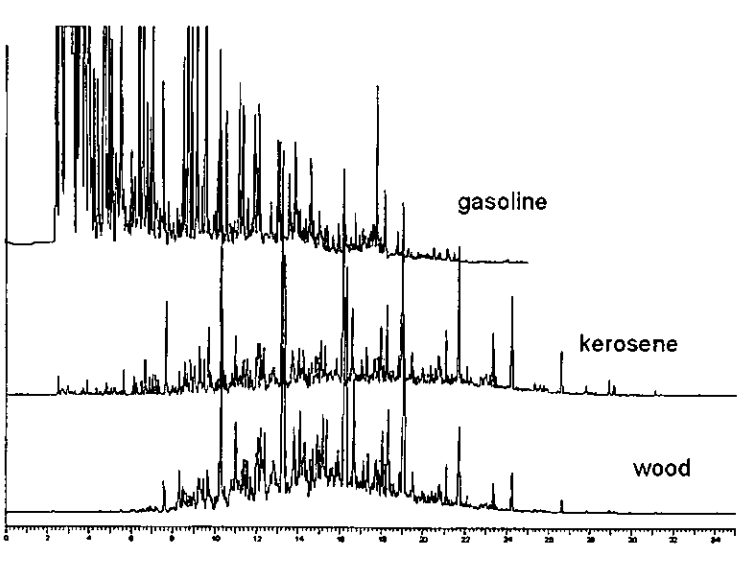


Figure 7: Comparison of section of burnt wood with the two accelerants confirming the presence of kerosene.

ATTENTION ALL PEPTIDE AND PROTEIN RESEARCHERS

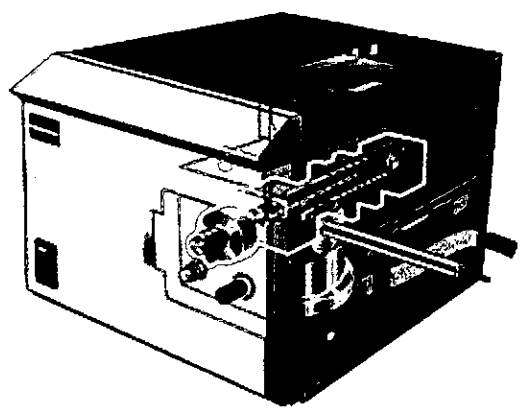
I have recently made contact with the organisers of the 4th International Australian Peptide Conference to be held at Club Med, Lindeman Island, Queensland, Australia, October 7 – 12, 2001 (see http://www.hfi.unimelb.edu.au/peptideoz). They are keen to establish a formal link with like-minded New Zealand researchers with the view to our involvement in this and future events and gatherings. With this in mind, I am putting together a data-base of New Zealand researchers working in the field of peptide and protein research. This is a good chance to give peptide researchers in New Zealand a bit of a profile and also an opportunity to forge closer links with our colleagues in Australia.

I am keen to find out about researchers with an interest in the chemistry, biology, physiology and analysis of peptides and related molecules.

I would very much appreciate receiving information (name, contact details and research interests) from people working in these and related areas

Andrew Abell
Department of Chemistry, University of Canterbury, a.abell@chem.canterbury.ac.nz

Chromatography



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AGILENT TECHNOLOGIES APPLICATION NOTES DESCRIBE SULFUR SELECTIVE DETECTORS

Agilent Technologies Inc. has released three application notes, titled respectively "A Comparison of Sulfur Selective Detectors for Low Level Analysis in Gaseous Streams" (Literature 5988-2426), "Automated Dynamic Blending System for the Agilent 6890 Gas Chromatograph: Low Level Sulfur Detection" (Literature 5988-2465)" and "Analysis of Trace Sulfur Compounds in Beverage Grade Carbon Dioxide" (Literature 5988-2464).

Comparison of Sulfur Selective Detectors for Low Level Analysis in Gaseous Streams

The "Comparison of Sulfur Selective Detectors for Low Level Analysis in Gaseous Streams" note discusses a comparison of four types of sulfur detectors for analysis of single-digit ppb level sulfur and compared with example applications used to demonstrate their operation under real-world conditions. The detectors include the AED (Atomic Emission Detector), SCD (Sulfur Chemiluminescent Detector), PFPD (Pulsed Flame Photometric Detector), and FPD (Flame Photometric Detector).

Applications showing detection of trace sulfur in hydrocarbon streams using these four detectors are presented. Agilent offers recommendations to help choose a chromatographic system to employ for a given application. If the matrix is reasonably simple and sulfur levels are in the low ppm to 50 ppb range then the FPD will usually be a good choice. In terms of overall performance, the AED will handle the widest range of applications obtaining carbon and sulfur chromatograms simultaneously without time consuming "tuning" for optimal operation. Analysis down to 5 ppb in complex matrices is easily accomplished.

Automated Dynamic Blending System for the Agilent 6890 Gas Chromatograph: Low Level Sulfur Detection

With the growing use of selective detectors for trace level analysis of volatile sulfur and other small molecules, a clear need has emerged for simple and reliable calibration/ blending systems. Accurate trace level gas analysis is critical in many diverse industries including hydrocarbon processing, semiconductor fab, and food/beverage. The "Automated Dynamic Blending System for the Agilent 6890 Gas Chromatograph: Low Level Sulfur Detection" application note reviews a novel point-of-use dynamic blending system for gaseous sample preparation and calibration that has been developed for the Agilent 6890 GC. This system is inexpensive, automatable, and can be assembled quickly with a few readily available components and one channel of an Aux EPC module. Calibrations to single digit ppbV levels are attainable with active components such as H_2S, COS, sulfides, and light mercaptans when the system is constructed with Silcosteel or Sulfinert tubing and fittings.

Analysis of Trace Sulfur Compounds in Beverage Grade Carbon Dioxide

The food and beverage industry has strict guidelines on the quality of CO_2 required for use in products for human consumption. Food grade CO_2 (>99.95%) can contain a number of impurities. Impurities can produce off-odours or flavours and in some rare instances a health hazard can result. Guidelines have been established recently for allowable levels of impurities by chemical type, the most common of which are acetaldehyde, methanol, ethanol, hydrogen sulfide, carbonyl sulfide, and sulfur dioxide. The "Analysis of Trace Sulfur Compounds in Beverage Grade Carbon Dioxide" application note examines detection methods for of these impurities. A chromatographic system based on the Agilent 6890 GC equipped with a sulfur selective detector can easily quantify sulfur at levels well below those required for food grade CO_2. The system is suitable for use in the laboratory, manufacturing plant, or storage terminal.

For detection of sulfur impurities in beverage grade CO_2 at levels down to 25 ppb, the FPD offers an easy-to-use low cost solution when coupled to the optimized sample introduction system. The AED offers the most complete solution when analysis of hydrocarbons is also desired with a single valve-column-detector combination.

The application notes are available without charge from any Agilent sales office.

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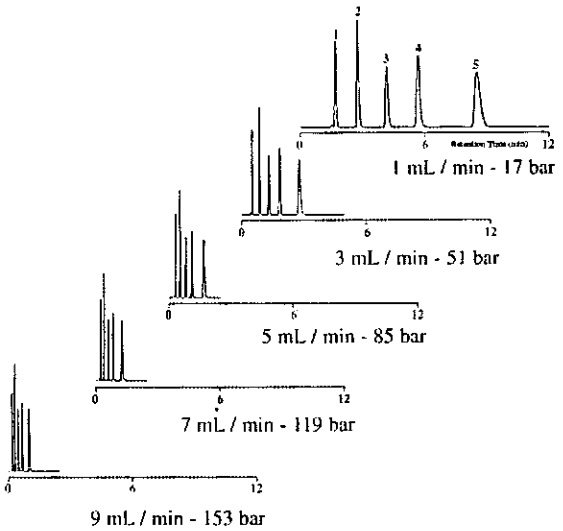
A NEW AGE IN CHROMATOGRAPHY ... THE CHROMOLITH™ HPLC COLUMN FROM MERCK

Chromolith™ is a new HPLC Column from Merck offering excellent separations in a fraction of the time of a standard particulate column and significantly increased sample throughput.

Chromolith™ columns are composed of highly porous monolithic rods of silica allowing formation of a revolutionary bimodal pore structure. Columns consist of both a macroporous and mesoporous structure. Each macropore is on average 2 mm in diameter, together forming a dense network of pores through which the eluent can rapidly flow. The mesopores form the finer porous structure (13 nm) of the column interior and create a very large surface area on which the adsorption of the target compounds can occur. Chromolith™ columns are still based on metal-free silica; therefore existing methods can be easily transferred.

Owing to the very high porosity of the Chromolith™ column, very high flow rates can be applied with very low

pressures. Flow rate can easily be varied from 1 mL up to 9 mL per minute whilst still achieving the same high quality resolution (see Figure 1). Mid-flow changes in flow rate can be employed to enhance the peak definition of the target compound, or to shorten the total separation time once the target compound has been eluted. Inlet bed settling or bed splitting has been eliminated due to the monolithic silica nature of Chromolith™; therefore column reliability, reproducibility and long life are ensured. The inner surface of the Chromolith™ column sorbent can be chemically derivatized in the same way as conventional particulate materials. This versatility makes them ideal as a first-line routine column in the laboratory.



Column: Chromolith™ Performance RP-18e (100 mm x 4,6 mm)
Mobile Phase: Isocratic acetonitrile / 0.1% trifluoroacetic acid in water, 20/80 (v/v)
Pressure: Total pressure (including HPLC system)
25°C. UV 220 nm. 5 µL Injection
Analytes: 1) 63 µg/mL Atenolol 2) 29 µg/mL Pindolol
3) 108 µg/mL Metoprolol 4) 104 µg/mL Celiprolol 5) 208 µg/mL Bisoprolol

Two Chromolith™ HPLC Column products are already available: Chromolith™ SpeedROD (50 mm) length for ultra-fast separation of simple mixtures and Chromolith™ Performance (100 mm length) for rapid separation of more complex mixtures. Chromolith™ SpeedROD RP-18e columns are perfect for ultra-fast analysis of simpler mixtures, typically containing four to five compounds. They are ideal for use in rapid screening of samples especially in research laboratories or those specialising in organic synthesis e.g. combinational chemistry. Chromolith™ Performance RP-18e columns provide rapid high-quality separation of complex multi-component mixtures. They are therefore perfect for use as a routine analytical tool in the quality control laboratory or in research laboratories where more complex mixtures are being analysed. Full technical information and applications are available on the website at www.chromolith.com

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Website: www.biolab.co.nz or
Merck New Zealand Ltd, P O Box 1246, Palmerston North, Phone: (06) 3582038, Fax: (06) 3567311,
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WATERS INTRODUCES TWO NEW HPLC SYSTEMS FOR MICROGRAM TO GRAM-SCALE AUTOPURIFICATION

Waters has introduced two new, high performance liquid chromatography systems for small molecule autopurification, one for UV-directed autopurification and another for mass-directed autopurification. The FractionLynx™ Systems allow any scientist involved in compound discovery to purify and collect newly-synthesized compounds in microgram to gram-scale quantities, perform impurity analyses, and purify library compounds in a high-throughput laboratory setting. With the UV-directed system, fraction collection is triggered by the UV detector based on absorbance signals obtained at specific wavelengths. Mass Directed Autopurification collects a single fraction from a complex mixture based on the analytes' molecular weight(s). The mass spectrometer evaluates peaks as they elute from the column and makes a decision whether or not to collect. Parallel columns and a regeneration pump can further enhance throughput without compromising chromatography.

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AGILENT TECHNOLOGIES INTRODUCES NEW ELECTRONIC VIAL CRIMPERS AND DECAPPERS

Agilent Technologies Inc. has introduced a range of commercially available battery-operated, handheld electronic vial crimpers and decappers. Designed to replace awkward and bulky manual crimping pliers, the Agilent electronic handheld crimpers give tight, reproducible seals every time. Adjustable, slim steel jaws fit around closely-spaced vials, enabling users to crimp vials directly in crowded autosampler trays.

Light weight and ergonomically designed to fit the user's hand, the electronic crimper eliminates wrist fatigue which is particularly good news for users who crimp large numbers of vials each day and who need consistent, reliable crimping. Two adjustment buttons set the crimping force and an internal microcontroller keeps the force consistent, ensuring a gas-tight seal on every vial. Settings are saved when the crimper is not in use or when the battery is being changed.

Using the same handheld design as the crimpers, Agilent's new line of electronic decappers remove caps instantly and is designed for laboratories that recycle or re-use vials.

These tools are available for 11 mm vials with aluminum seals and 20 mm headspace/serum vials. The electronic crimpers and decappers also work with Agilent's new 1.5 mL micro-V vials, which provide exceptionally high sample recovery.

Both the crimper and decapper come with an environmentally-friendly nickel-metal-hydride rechargeable high-capacity battery and a Black & Decker VersaPak Gold battery charger (available in different types for international use). A spare and/or replacement VersaPak battery is also available.

The precision machined jaws of the Agilent Crimper or Decapper allow for crimping and decapping in tight spaces.

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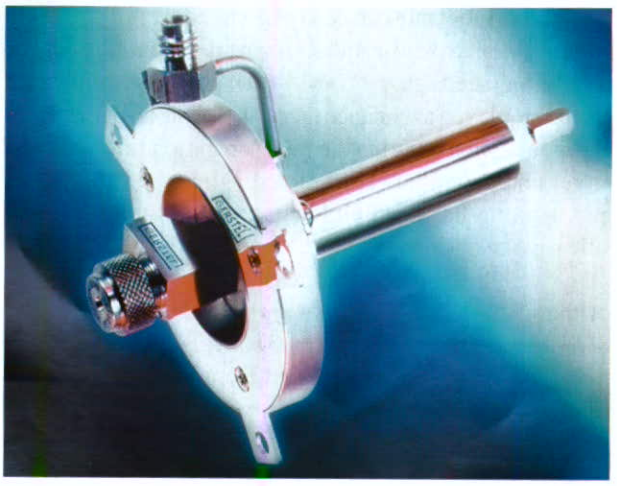
GERSTEL THERMAL DESORPTION SYSTEM CAN BE INTERFACED WITH A WIDE RANGE OF GAS CHROMATOGRAPHS



A new cooled injection system (CIS 3 S) enables Gerstel Thermal Desorption Systems to interface to GC systems such as the Varian 3800 GC , Saturn GC/MS or Perkin Elmer GC. Using the Gerstel Twister™, it provides complete sample recovery and lowers detection capability to the ppt and ppq ranges.

The cooled injection port serves as a refocusing module for thermal desorption, providing headspace, large-volume liquid and SPME injections. The port functions in 7 different modes and is optimized for capillary column GC columns with septumless head for ultra-low bleed and no sample discrimination.

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NEW MICROMEMBRANE SUPPRESSOR III WITH DISPLACEMENT CHEMICAL REGENERATION MODE OF OPERATION

Ai Scientific introduces Dionex's MMS III MicroMembrane Suppressor for ion chromatography with the new Displacement Chemical Regeneration mode of operation. The MMS III can be used with all Dionex ion exchange columns and is recommended for anion and cation separations using eluents containing HPLC solvents. The MMS III is available in both 2- and 4-mm formats; 3-mm columns should be used with 2-mm suppressors. The MMS III suppressor is a direct replacement for the MMS II suppressor. The MMS III suppressor has several significant design enhancements for improved ease of use, including a new encasement that is easy to install in all chromatography modules, higher capacity membranes for more efficient transport of regenerant ions, and a new design for minimal internal dead volume and peak dispersion, resulting in more efficient peaks and lower detection limits. Its suppression capacity can accommodate suppression requirements of all Dionex anion and cation applications. The Displacement Chemical Regeneration (DCR) Mode is a new mode of operation for chemical suppressors including the MMS III. The easy-to-use DCR mode is engineered into the new DX-80 Ion Analyzer. A complete line of eluent, regenerant, and standard concentrates are available for easy reagent preparation. The DCR mode overcomes the need for regenerant flow control. It provides a simple means to deliver regenerant and allows unattended and effortless operation, offering an economical option to the AutoRegen or Pressurized Bottle modes of operation. DCR Mode also provides low drift and very low noise (<1nS), resulting in lower minimum detection limits.

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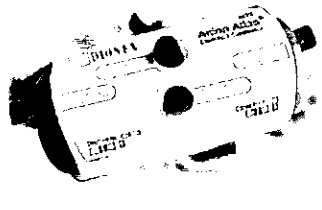
NEW ATLAS ELECTROLYTIC SUPPRESSOR FROM DIONEX

Ai Scientific introduces the new Atlas Electrolytic Suppressor for ion chromatography from Dionex. The Atlas suppressor is a fifth-generation advancement in eluent suppression technology providing lower baseline noise, faster start-up, ease-of-use, ruggedness, and reliability. The Atlas Electrolytic Suppressor is a new concept in continuous electrolytic eluent suppression for IC applications. Its suppression bed is made of innovative ion exchange monolith and flow distribution disks, producing maximum capacity with minimal dead volume. The Atlas Electrolytic Suppressor can be used for most IC applications requiring carbonate or methanesulfonic acid eluents and suppression capacity up to 25 mN at 1.0 mL/min; it is suitable for 4-, 3-, and 2-mm i.d. column applications. Due to the improved baseline noise, method detection limits can be decreased by as much as threefold by using the Atlas Electrolytic Suppressor. The Atlas Electrolytic Suppressor is available for the full range of Dionex IC instruments, including the DX-320 and DX-600 ion chromatography systems. The Atlas capability can be extended to earlier Dionex instruments including the DX-120 and DX-500 IC systems through use of the SC20 external power supply module.



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AGILENT TECHNOLOGIES INTRODUCES NEW GENERAL PURPOSE MICRO GC

Agilent Technologies Inc. recently announced the introduction of the Agilent 3000 Micro GC for general purpose measurement. The 3000 Micro GC provides high instrument availability for determining chemical composition in HPI, natural gas, fuel cell, industrial gas, chemical, and oil and gas exploration applications.

The 3000 Micro GC enables operators not skilled in chromatography to quickly and easily obtain accurate measurements in a wide variety of applications. They include natural gas, industrial gas, refining and chemicals in the QA/QC labs. In the research and development environment, it has been successfully deployed in natural gas, refinery gas, chemical and fuel cell applications. Outside of the laboratory, the micro GC provides an effective tool for field and process at-line needs in natural gas, refining, and oil and gas exploration applications.

The 3000 Micro GC provides all of these applications with the availability so vital to these critical applications. It achieves this by providing a highly reliable analyzer that can be quickly and easily diagnosed and repaired onsite with "plug-in" replacement modules. The user can install these modules when indicated by the system's onboard diagnostic software.

Other key attributes of the instrument include small size and transportability for measurement at or near the sampling point; reproducible accuracy in the assessment of composition, including impurities; and speed of analysis not available from traditional measurement techniques. While traditional techniques return results in the order of minutes, the 3000 delivers results in less than 120 seconds.

Compared with its predecessor, the Agilent 3000 Micro GC has added features designed to enable in-field supportability, which include:

- LAN connectivity for remote access to the instrument and data;
- extended dynamic range enabling simultaneous analysis of major and minor components;
- digital pneumatics for reproducible performance regardless of operator skill levels;
- Cerity NDS software designed for ease-of-use by the technical operator;
- GPA, ASTM, or ISO natural gas reporting options;
- reduced measurement susceptibility to the effects of ambient temperature and pressure; and
- a more robust injector design.

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SD-2 PREP HPLC SYSTEM SPEEDS PURIFICATION OF PHARMACEUTICAL DRUG ACTIVE INGREDIENTS

Ai Scientific is proud to announce the release of a new bench-top preparative HPLC system offering pharmaceutical companies higher throughput and process capabilities. The SD-2 Prep HPLC system is a key tool in the drug discovery process, helping laboratories purify pharmaceutical drug active ingredients for testing and trials prior to the manufacturing step. Providing higher flow with higher-pressure capabilities than earlier Varian systems, the SD-2 allows laboratories to use larger columns, providing increased purification throughput. New control software and integrated functions make the SD-2 a more process-oriented solution, similar to production HPLC systems. Integrated functions include injection, high pressure/low pressure gradient formation and fraction collection along with process documentation capabilities. Major purification applications for the SD-2 include pharmaceutical compounds, fine chemicals and bioscience materials. For pharmaceuticals and fine chemicals, the higher-pressure operation and process orientation of the SD-2 are important features. Biotechnology laboratories will benefit from new detector monitoring functions, such as pH and conductivity, a validation capability and special easy-to-clean plumbing fixtures. Varian, Inc. is now the only single-source supplier of systems for all steps in the preparative chromatography process, all of which are based on the same control software platform. Because Varian, Inc.'s integrated offerings make scale-up from the laboratory bench to production a seamless and predictable process, they can help pharmaceutical and biotechnology firms speed new products to market. Varian, Inc. offerings include flash chromatography for the rapid purification of small amounts of synthetic or naturally derived compounds, analytical/preparative HPLC systems used throughout the drug development and discovery process, preparative systems for recovering compounds for testing/trials, and process systems used to recover compounds in large volume for pharmaceutical production.

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AGILENT TECHNOLOGIES INTRODUCES NEW NATURAL GAS ANALYZER

Agilent Technologies Inc. recently announced the introduction of the Agilent 3000 Natural Gas Analyzer (NGA). The 3000 NGA is a guaranteed turnkey solution for determining calorific value and percent composition of natural gas in critical applications where analyzer availability is essential. This new analyzer provides high availability through a modular construction that is easy to use, highly reliable, and on-site supportable.

The 3000 NGA enables operators not skilled in chromatography to quickly and easily obtain accurate measurements in critical natural gas applications. These applications include situations where there is a transfer of custody, a need for validation or certification of online instrumentation measurement, periodic need for QA measurement of a gas stream, troubleshooting, or when failure to meet pipeline specifications could be costly or disastrous. In all of these situations, instrument availability is vital.

The 3000 NGA includes a variety of features for high reliability. To further maximize availability, the analyzer can be quickly and easily diagnosed and repaired onsite with "plug-in" replacement modules. These modules can be installed by the user when indicated by the system's on-board diagnostic software.

The 3000 NGA offers speed of analysis not available in traditional measurement techniques. While traditional techniques return results in the order of minutes, the 3000 delivers results in less than 120 seconds. A turnkey solution, the 3000 NGA includes an instrument, method, application-specific software, calibration gases, and computer. Agilent supports the 3000 NGA with installation and training, software support, a comprehensive system warranty, and bench-repair facilities worldwide.

The analyzer is factory-configured to meet specific gas measurement needs and reports analytical results in accordance with GPA, ASTM and ISO calculation standards. Typical gas streams include all fixed gases, C_1-C_5 hydrocarbons from ppm to high percentage value, and C_6-C_{12} from ppm to low percentage value. With the use of special sample conditioners, even more challenging streams can be measured, including liquefied petroleum gas (LPG), high calorific content natural gas, or liquefied natural gas (LNG).

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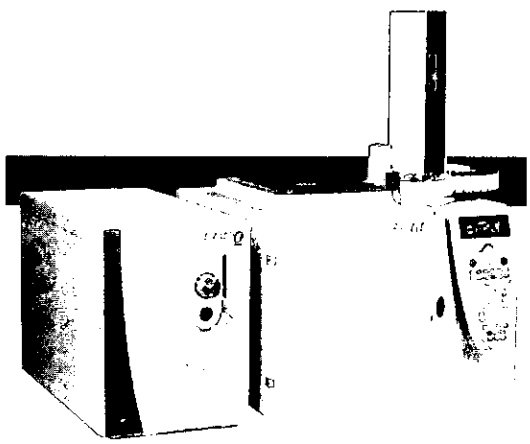
NEW GC/MS FROM THERMOFINNIGAN

ThermoFinnigan is pleased to introduce two new GC/MS systems ...

Polaris*Q*

The Polaris*Q* is the rugged, affordable answer for quadrupole ion trap GC/MS and GC/MS/MS analyses. It combines optimized hardware with the powerful Xcalibur™ data system to dramatically cut analysis times for identifying unknowns - even in challenging matrices. Polaris*Q* features next-generation external ionization technology for outstanding sensitivity and linearity as well as reduced source maintenance requirements. The newly optimized external ion source allows the chromatographer to meet all standard tuning requirements and quantitate samples from the very low picogram range to the mid-nanogram range.

Adding the power of MS/MS helps the chemist routinely analyze samples that cannot be tested with other benchtop mass spectrometers.



The Polaris*Q* truly offers the chromatographer a versatile, powerful and reliable solution for GC/MS analysis, delivering research-quality results at an affordable price.

- Unparalleled selectivity
- Optimized inlet device
- Unsurpassed quantitation
- User-defined reporting tools
- MS/MS for confirmation

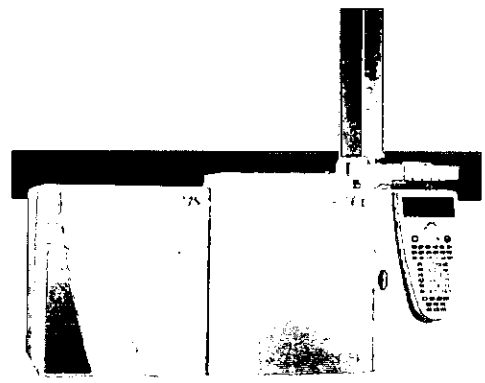
TEMPUS™ Time-Of Flight (TOF) GC/MS

The latest innovation in rapid detection for fast gas chromatography is the TEMPUS TOF MS. TEMPUS delivers the best available performance without compromise - maximum information with maximum sensitivity in the shortest possible time. The unique design of the instrument enables very high throughput quantitation and simultaneous confirmation for fast GC. TEMPUS easily handles complex mixtures and matrices, delivering full spectral data all the time with no need for re-dilution. This simplifies the complexity and hence the time required for completion of an analysis.

The TEMPUS system is suitable for a vast array of applications, including petrochemical, environmental, and fragrance and flavours. With the unique combination of a huge dynamic range and full-scan linearity (exceeding five decades), the accurate quantitation generated by the TEMPUS is second to none. It is simple to set up and provides easy-to-interpret analyses.

The TEMPUS delivers power and ease-of-use in a compact, state-of-the-art benchtop instrument. All this performance is controlled by the simple, fully-automated Xcalibur™ software, providing unrivalled GC/MS performance without the need for MS expertise. With fast sample analysis and intelligent generation of results, the TEMPUS will give you GC/MS analytical productivity without boundaries.

- Super-fast MS detection
- Full-scan spectra with high sensitivity
- Over five decades of dynamic range in full scan
- Classical EI spectra-standard libraries
- EPA-ready for complex mixtures



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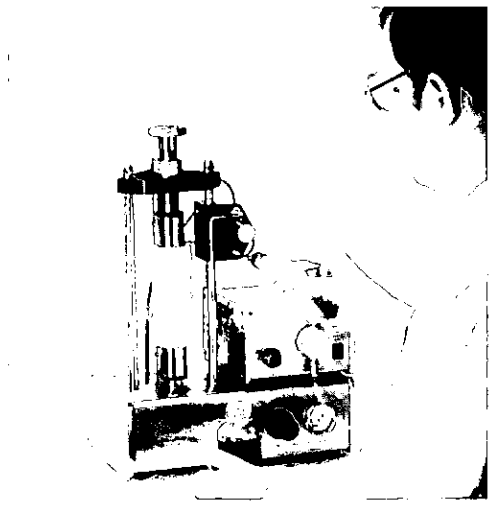
NEW VARIAN, INC. CHROMA..ZONE™ FLASH PURIFICATION SYSTEM FOR RESEARCH AND PILOT STAGE DRUG DISCOVERY

Varian, Inc. has released the Chroma..Zone™ High Throughput Zonal Purification (HTZP) system, a simple and safe flash chromatography solution for rapidly purifying organic compounds used in the early stages of

drug discovery. With Chroma..Zone, organic and medicinal chemists can quickly purify synthesis reaction mixtures and natural product extractions for pharmaceutical research.

The bench-top Chroma..Zone HTZP is a complete solution including a cartridge compression system, pump module and cartridges. It represents a significant improvement over other flash chromatography apparatus. A unique Double Axial™ compression module secures, seals and compresses the cartridge for stability, safety and zonal purification integrity. The module allows for easy and fast cartridge loading and removal while providing optimum conditions for the separation of target components of the mixture. As the distinct zones elute from the cartridge, they are collected easily for further testing.



Currently available flash chromatography cartridges are subject to leakage, which can prove costly and unsafe. Chroma..Zone uses leak-free, disposable, pre-packed cartridges that are easier to use and replace in the Double Axial compression system. They can be reversed for rapid collection of late eluting zones. Cartridges are available pre-packed with silica and several bonded chemistries for the purification of nearly all classes of compounds.

An optional pump module eases solvent delivery and facilitates rapid solvent replenishment. Using an in-line loading valve, the sample mixture is loaded directly onto the cartridge eliminating contamination from the previous sample.

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SORPTIVE EXTRACTION LOWERS DETECTION LIMITS IN TDS/GC/MS

The patented Gerstel Twister™ Accessory includes a magnetic Stir-Bar with a polydimelthyl siloxane coating, to quickly extract organic compounds from aqueous and other stirrable samples without the use of solvents.

- Thermal desorption allows complete recovery. Compounds partition into the stir bar coating, leaving the non-volatile matrix behind.
- CIS secondary refocusing enables splitless injection on the chromatographic column, ensuring maximum sample coupling, and extending detection limits to the ppt and ppq ranges.
- High flow thermal desorption enables transfer of high-boiling compounds at lower temperatures.

The Gerstel Twister Accessory may be easily automated with the TDS A autosampler.

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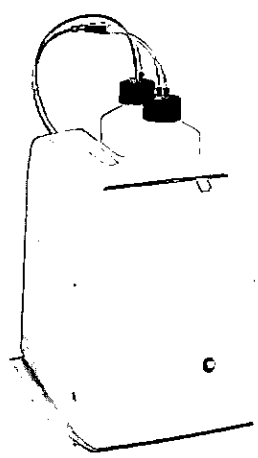
NEW ION ANALYSER FROM DIONEX

Dionex announces the release of the DX-80 Ion Analyzer, a reliable, low cost instrument for the analysis of anions or cations. The DX-80 is a pre-configured ion analyzer, specifically designed for routine ion analysis and is the smallest ion analyzer available today. Advanced electronics



give reliable, high resolution digital conductivity detection over a 500 pS range without using complicated range settings. The cell is temperature controlled and, when used with the continuous suppression of the MMS III, provides low noise and stable baselines. The result is reliable, sensitive analysis over a concentration range from one part per billion to hundreds of parts per million. Fluid delivery is through a high-speed reciprocating PEEK pump with a single set of check valves and seals to minimize maintenance costs.

The DX-80 is fully controlled with PeakNet-IA software, the easiest to learn software yet developed for an ion analysis system. Virtually all functions are accessed from one intuitive screen. Users simply enter their sample information, push START and results for each sample are displayed in a table as each run is completed. Individual chromatograms can be reviewed and the pre-optimized integration can be altered with drag-and-drop tools. Recalibration is easy using the predefined calibration routines. Pre-loaded integration and calibration methods simplify day-to-day operations and training.

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OBITUARY

Professor Robert Brooks, FNZIC

It is with great sadness that we record the death of Robert Brooks on Tuesday, 23 January 2001. Robert was a member of the Chemistry and Biochemistry Department at Massey University for many years. He was a distinguished international scholar and an eccentric in the grand style. The stories he related in the tea room are the stuff of legend, and those of us who were fortunate enough to hear them need only certain key words to initiate bouts of laughter. The following are tributes to Robert the scientist, Robert the friend and Robert the man of action. Unfortunately, they only scratch the surface of his extraordinary and colourful life. Indeed, it would require a literary work of many volumes to do justice to Robert's life and achievements.

Born in Bristol, England, in 1926, Robert Brooks received his school education in Sheffield before returning to Bristol to take employment during World War II. He was called into the British Army late in the war, and saw postwar service in East Africa and the Middle East. Back in the UK, he entered the University of Bristol, from which he graduated in chemistry in 1952. After experience as an industrial chemist in the zinc smelting and printing industries, Robert travelled to South Africa, where he carried out his PhD studies with the noted geochemist Louis Ahrens, working on ion-exchange separations and emission spectrographic analysis. This early work in analytical chemistry became the basis of his future career in both teaching and research.

Leaving what he foresaw as certain turmoil in South Africa in 1960, Robert took a lectureship in chemistry at Massey University, where he was based for the remainder of his career. His international contributions to science were recognised at Massey University by the award of a DSc in 1977 and a personal chair in geochemistry in 1987. He was elected to Fellowship of the Royal Society of New Zealand in 1996. Although Robert formally retired from the Department of Chemistry and Biochemistry in 1991, this was a retirement in name only. As Professor Emeritus and Honorary Research Fellow in what evolved into Soil and Earth Sciences in the Institute of Natural Resources, he continued the pursuit of his research interests for another nine years.

Through the 1960s Robert developed his interests in elemental analysis, particularly by atomic spectroscopic methods, and was always searching for ways of applying his analytical knowledge to practical problems in many fields — archaeology, mineral exploration, environmental pollution, and the uptake of trace elements by plants and animals. His 1965 paper with M G Rumsby on metal accumulation in shellfish organs subsequently became a Current Contents "Citation Classic". Over many years Robert and his students and colleagues worked on the relationship between elemental concentrations in soils and the plants they supported, initially with a particular interest in the possibility of using plant analysis in prospecting for, and delineating, mineral deposits.

In the late 1960s, a visit to Dun Mountain, one of New Zealand's best-known serpentine soil sites, kindled an enthusiasm for the study of serpentine floras. Shortly afterwards, in the course of a biogeochemical survey of nickel prospects in Western Australia, extremely high nickel accumulation by *Hybanthus floribundus* was discovered; such behaviour was previously known only in three species of *Alyssum*. The interest in nickel accumulation was reinforced by a chance meeting with Dr Tanguy Jaffré, working with ORSTOM in New Caledonia, which led to a long period of collaborative work on many aspects of the island's serpentine endemic flora. For almost 30 years Robert Brooks, Roger Reeves and their students and collaborators have carried out a large amount of analytical work on soils and plants from both serpentine and other metalliferous areas in many parts of the world. A notable feature of the work was the use of herbarium specimens, as well as samples collected directly from the field. The work carried out at Massey University has been responsible for establishing about 85% of the world's 330 known nickel hyperaccumulating species, and most of the smaller numbers of instances of accumulation of copper and cobalt.

It was particularly gratifying to Robert that in the last few years there has been an upsurge of interest in the potential for using metal-tolerant plants in general, and metal hyperaccumulators in particular, to help in solving various kinds of metal-contamination problems arising from industries such as mining and smelting. In recent times, special interest from the news media followed his work on encouraging plants growing on areas of goldmine tailings to increase their minute uptake of gold through chemical modification of the soil. At the time of his death, Robert was on the point of being awarded a research grant by the National Geographic Society (USA) for studies of the flora of the copper- and gold-bearing areas over a range of altitudes from 1700-5000 m on Puncak Jaya in West Irian.

Robert's analytical talents were also used to investigate geological and cosmological problems, as shown by his publications on trace elements (especially noble metals) in iron meteorites and in clay samples from Cretaceous-Tertiary boundary sites, where the presence of a thin layer of extraterrestrial material can be inferred from the unusually high noble-metal content.

Robert's fluency in languages (French, German and Russian, in particular), and his correspondence with a wide circle of scientists, helped him to develop research interests that took him to many parts of the world (Australia, New

Caledonia, Sri Lanka, Canada, USA, Brazil and other parts of South America, Zaïre, China, USSR, and several countries in Europe). He was supervisor or co-supervisor of the work of about 45 research students. Together with his many New Zealand and overseas collaborators, Robert produced an impressive list of about 300 publications, including ten books. His 1987 book '*Serpentine and its Vegetation*' is now the standard starting point for all who wish to enter this field of research. His books are testimony to the enormous amount of work that Robert did in collating, reading, interpreting and summarizing the literature in a variety of fields, and the scientific world is greatly indebted to him for turning his energies and talents in this direction.

All those who worked with Robert remember him for his ceaseless energy, his ability to turn ideas into work accomplished, his fund of anecdotes, his uncanny knack of encountering (and generating) problems while travelling or in the field, the speed with which solutions to the problems were found, and the delight with which he told and retold his adventures. A rare quality was the special pleasure he reserved for the recounting of experiences where he was the victim of his own impulsiveness. In all of these ways Robert Brooks was a most stimulating friend and colleague who will live on through many memories and stories, and through a remarkable legacy of discovery and published work.

Roger Reeves and Ken Jolley
Massey University, Palmerston North

Organic Synthesis The Easy Way?

Traditionally, one of the ways that organic chemists have proved their worth is by carrying out a painstaking total synthesis of a complex naturally occurring molecule that could form the basis of a new drug. Now a team of chemists from Duke University, San Diego, US, has used combinatorial chemistry techniques to synthesise just such a molecule, which could be used as a treatment for diabetes. At a recent national meeting of the American Chemical Society, the team announced that it had succeeded in synthesising a natural compound called demethylasterriquinone 131 (DAQ), which was originally extracted from an African fungus called Pseudomassaria. Research carried out by scientists at the US pharmaceutical company Merck in 1999 showed that DAQ is able to activate human insulin receptors, even though activating receptors in the body is usually the preserve of proteins. With this ability, DAQ could form part of an oral treatment for diabetes, a disorder that is caused by the body not producing enough insulin. Current diabetes treatments involve patients injecting themselves with a version of the insulin protein derived from cattle.

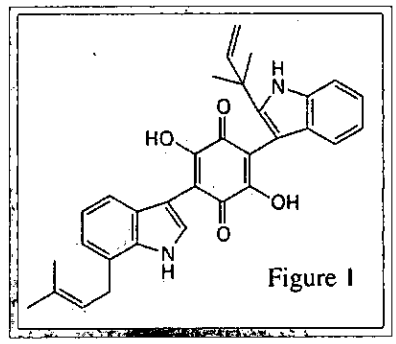

Figure 1

The main challenge for the Duke team, led by Michael Pirrung, was to synthesise DAQ using combinatorial chemistry. As Pirrung explains, "one area that combinatorial chemistry has previously not really made any inroads into is naturally occurring compounds". The challenge was made easier, however, by the fact that DAQ is highly modular. "It has an indole ring, a quinone ring and a different indole ring (see Figure 1). So that makes it perfect for combinatorial chemistry", explains Pirrung. "If you have three variants of the first module, three of the second and three of the third, just by combining all those forms there are 27 possible compounds to make. So that enables you to make very large collections of molecules".

NEW RESEARCH

Using combinatorial chemistry reactions, Pirrung and his team were able to develop several novel methods for synthesising the bisindolylquinone core structure of the asterriquinones. These methods included the acid-catalysed condensation of benzoquinones with indoles, the Heck reaction of 3-mer-curioindoles with dichlorobenzoquinone and the Stille reaction of 3-stannylindoles with brominated quinones. These efforts produced a range of asterriquinone analogues and eventually culminated in the total synthesis of DAQ.

As far as Pirrung is concerned, one of the most interesting aspects of this work is that the synthesis of DAQ and the other asterriquinone analogues is now "enabling us to address basic questions about the insulin receptors and how they work".

Pirrung also hopes that DAQ (and its analogues may help to answer questions about other cellular receptors, such as those for growth factors. "We're thinking that these molecules we've been working on might have what medicinal chemists sometimes call a 'privileged structure'", he says. "What we're hoping is that this initial hit has got us into chemicals that have privileged structures for growth factor receptors".

Chemistry in Britain, **37**:6, June 2001

"Molecules For Life"

NZIC Conference 2001

Napier, New Zealand, December 4-7, 2001

The NZIC Conference in 2001 will be a joint conference with the New Zealand Biotechnology Association, and the New Zealand Society for Biochemistry and Molecular Biology. This is the first time the three groups have held a joint meeting, and the first time for all of them in Napier. The choice of Napier is both a recognition of Hawkes Bay as an important NZIC regional sub-group, and also an innovative choice breaking away from the traditional university venues, to give a more relaxed environment.

For more details, and to enrol, see the website at: www.hort.co.nz/nzic. The conference has attracted significant sponsorship, with Baldwin Shelston Waters Intellectual Property, and HortResearch as Gold and Silver sponsors respectively.

The conference will be held in Napier's War Memorial Centre, on the foreshore. The meeting promises to be an exciting mix of stimulating speakers (we have 8 invited international speakers, to lead the various conference themes), and social activites.

Conference Themes

The general theme of the conference is *"Molecules for Life"*. Specific themes of keynote and plenary lectures include:

- The Chemistry of Good Taste
- *in silico* Biology (Bioinformatics, computational biology)
- Green Science
- *Food in Health*
- Structural Biology
- Publish & Perish?
- *Molecular Design and Construction* (including Supramolecular Chemistry)
- New Technologies in Education
- Molecular Basis of Disease
- Biotechnology
- Fermentation
- Natural Products
- Glycotechnology
- *Physical, Organic, Inorganic and Organometallic Chemistry*, and other specialist groups will also be having a programmes.
- A *Nanomaterials Symposium* will be held in conjunction with the conference.

The Green Science theme will be led by Professor Terry Collins, who is the Director of The Institute for Green Oxidation Chemistry. The Institute for Green Oxidation Chemistry has been established at Carnegie Mellon University as a research, education and development centre in which a holistic approach to *sustainability science* is being developed.

The research of the Institute is focused in the third of three major problem areas where green chemists can make major contributions to sustainability. First, *renewable energy technologies*, especially *solar technologies*, will be the central pillar of a sustainable high technology civilization. The contribution chemists can make here relates to the development of the economically feasible conversion of solar into chemical energy and the improvement of solar to electrical energy conversion. Second, *chemical feed stocks* must increasingly be obtained from renewable sources to reduce our dependence upon fossilized carbon and to protect the atmosphere. Third, *polluting technologies must be replaced by benign alternatives*. Research carried out in the Institute is focused on the pollution reduction component of green or sustainable chemistry. Research programs are evolving around the scientific and technological development of TAML® hydrogen peroxide activators which where invented in the Collins Group and which have been extensively patented and trademarked by Carnegie Mellon University as explained on their website.

Chemical education will be led by Professor Roy Tasker of the University of Western Sydney. His R & D interests are in interactive multimedia in science education - particularly in chemistry and biochemistry. Since January 1999 he has been on full-time release from the University, working in partnership with CADRE design (see www.cadre.com.au), a multimedia production spin-off company from the University.

THE VISCHEM PROJECT: VISUALISATION OF CHEMISTRY USING MULTIMEDIA

Project Coordinator: Dr Roy Tasker

Understanding chemistry involves being able to link what one sees substances doing in the laboratory, to what one imagines is happening within these substances at the invisible molecular/ionic level. Only then can these ideas be communicated using abstract symbolism (e.g. chemical formulas), terminology and mathematics. The VisChem Project team is producing multimedia resources (animations, video, text and sound) to explicitly link these three levels - the laboratory, molecular/ionic, and symbolic.

The most important resources are the 3-D animations that portray chemical substances and their physical and chemical changes at the molecular level. These animations are unique in terms of attention to theoretical detail (with artistic licence dually acknowledged and used for educational reasons), and they are designed to correct specific misconceptions in chemistry identified from science education research.

The Glycotechnology session will be led by Professor BarbaraImperiali, Ellen Swallow Richards Professor of

Chemistry, Massachusetts Institute of Technology, Boston, USA.

Professor Imperiali received her BSc in medicinal chemistry from University College, London in 1979 and her PhD in synthetic organic chemistry four years later from MIT. After two years of postdoctoral research with Professor S Masamune of MIT and Professor R Abeles of Brandeis, she went on to become Assistant Professor of Chemistry at Carnegie-Mellon University in 1986. By 1989 she had transferred to California Institute of Technology, where she was named a full Professor in 1997. She came to MIT as the Ellen Swallow Richards Professor of Chemistry in 1999. She has been recognized with numerous honours, including a Sloan Research Fellowship, a Camille and Henry Dreyfus Teacher-Scholar Award, and an Arthur C Cope Scholar Award. Professor Imperiali has also received a number of awards for excellence in teaching. In 1992 she organized the first Gordon Conference on Bioorganic Chemistry, and remains an at-large member of the Council of Gordon Research Conferences. She is a member of the editorial board for ten journals, and is the author of some seventy articles and four patents.

Professor Imperiali's research interests include diverse aspects of protein structure, function, and design. Major projects in her research group include a study of protein glycosylation and the biosynthesis of glycoprotein conjugates; *de novo* protein design based on the assembly of small (20-40 residues) polypeptides and the use of coenzyme amino acid chimeras in the assembly of functional polypeptide motifs; and the use of selective metal-ligating moieties based on natural structures such as zinc fingers, serum albumin proteins, and siderophores to develop selective and sensitive sensors for metal ions.

The Imperiali Web Page says: "Research in our group has placed a particular emphasis on the central processes of protein glycosylation and the biosynthesis of glycoprotein conjugates. One of the transformations that we have studied in depth is *N*-linked glycosylation of asparagine mediated by *oligosaccharyl transferase* (OT). Biophysical studies have been utilized to show that the protein glycosylation event appears to induce conformational changes in the polypeptide structure.

Kinetic and spectroscopic studies on synthetic, conformationally constrained peptidyl substrates have led to insights into the mechanism of *N*-linked glycosylation as well as the development of tight-binding OT inhibitors. Current efforts focus on the modification of these inhibitors to allow transport through the cell membrane for *in vivo* studies. We are also developing transition-state inhibitors based on the lipid-linked oligosaccharides that serve as a necessary substrate for protein glycosylation.

In addition, we are working to enhance the cloning and over-expression of OT in order to identify the protein subunits essential for enzyme activity. This knowledge will enable mutagenesis studies to define the residues comprising the OT active site. Furthermore, increased expression of the enzyme will enable structural characterization of the protein and the development of new mechanistic studies."

Molecular Design and Construction will be led by Professor Chris Easton. From his web page: "One main theme of our research involves the investigation of reaction mechanisms related to biochemical processes, either through the study of reactions of model compounds or by studying the biochemical systems directly. In the area of amino acid and peptide chemistry, investigations of the mechanisms of free radical reactions of amino acid derivatives have led to the development of hypotheses to account for the side chain functionalisation of amino acids and peptides during secondary metabolism. Other processes which occur commonly in the biodegradation of peptides and proteins are under investigation, as is the formulation of a model for the biosynthesis of peptide hormones. The latter model is being used to design novel enzyme inhibitors, in order to control metabolic disorders associated with hormone over-production. Arising from the mechanistic studies, new procedures have been developed for the synthesis of amino acid derivatives, including antibiotics and other pharmaceuticals derived from cyclic peptides.

Other research on biochemical systems includes analytical, synthetic and mechanistic studies of natural and modified lipids. In some cases these are associated with metabolic disorders, while in other cases specific immmunological responses are being sought. This work is being carried out in collaboration with Peptech (Australia) and the Adelaide Medical Centre for Women and Children, and has led to the development of new compounds with activity as antimalarial and antiinflammatory agents.

Another principle area of research is carried out in collaboration with the University of Adelaide and involves the design and synthesis of molecular hosts and studies of thermodynamic discrimination, catalysis and kinetic resolution by host-guest complexes. Most of this work involves modified cyclodextrins as hosts, where the cyclodextrins are designed to have particular physical properties, including high solubility in aqueous systems, and tailored to form inclusion complexes with specific guests. Results in this area include the development of procedures for the synthesis and resolution of chiral molecules, new methods for the administration of pharmaceuticals, new catalysts based on metallocyclodextrins and novel molecular reactors. The latter work is aimed towards the development of artificial enzymes."

The Inorganic and Organometallic Specialist Group has planned a strong programme including three overseas speakers:
Mike Ward (Bristol) - "Self-assembly in coordination chemistry: anion-templated assembly of supramolecular cages".
Bert Kersting (Freiburg) - "Activation of small molecules in hydrophobic binding pockets".
Terry Collins (Carnegie Mellon) - "Green applications of TetraAmidoMacrocylicLigand (TAML®) Catalysts from the Activation of Hydrogen Peroxide".
Also Sally Brooker will deliver the Easterfield Lecture "Running rings round metal ions".
There will be opportunity for others to be included in the oral programme.

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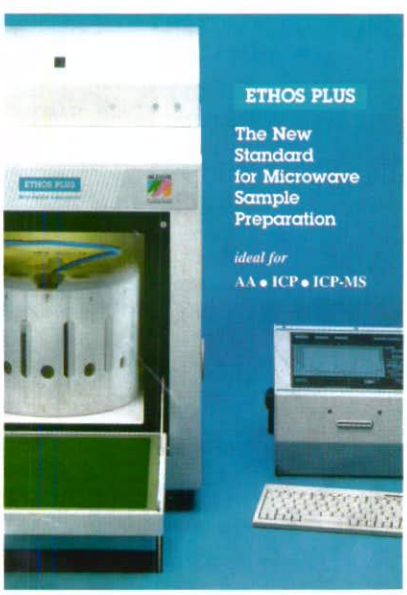

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