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A MESSAGE FROM THE NZIC PRESIDENT

It is a pleasure to be able to introduce members to our "new" journal. I am sure that with the combined enthusiasm of the Publishers and the Editorial Board we are in for many years of interesting reading.

I would like to make a request to all members to feel that this is your own publication and to realise that the President and Council Officers cannot make it a success. It will succeed only with your support. The editor and his staff welcome contributions from you on all topics of interest to chemists and the wider scientific, educational and industrial community.

This new journal will be the ideal vehicle to pass on your concerns, opinions and observations to a wider range of readership than on any other occasion in the past. It is also essential for members in more remote areas that information on people and events is also made available on a regular basis.

I can report that our first vice-president has visited Australia and conducted discussions with RACI to further promote cooperation between the two institutes. You will see much evidence of this in future conferences etc.

I look forward to meeting you on the President's tour in the near future.

Stan Winter FNZIC
PRESIDENT

FROM THE EDITORIAL BOARD

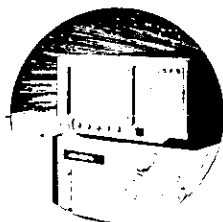
As we hope you have noticed, this edition of Chemistry in New Zealand is in the hands of a new publisher, Ancat Holdings Ltd, and a new Publisher's Editor, Robert Lyon. It is also our first venture into the concept of an Editorial Board who will oversee the format and technical content of the Journal. As one of the most visible functions of the Institute, the quality of the technical content, the image and professionalism projected by the Journal are, we believe, very important to the Institute as a whole. It is probably fair to say the Journal has had something of an identity crisis in the past few years and the new direction is, with considerable assistance from Ancat, the Institutes response to this. With the new publishing format, we hope to cater for a wider scientific audience than ever before and so attract new members to the Institute by breaking new ground and presenting material in fields not previously addressed in the Journal. We would urge you to be supportive, particularly by submitting both quality technical articles and the "news" material we need to keep our increasingly fragmented chemistry community in touch with one another. We look forward to your co-operation and a successful future for this "new look" publication.

Jim Metson • Roger Whiting • Ron Hall
Robert Lyon • Neil McLaughlin

FRONT COVER

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For further information see the cover story on page 2.



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SHIMADZU
and
COULBROS
ANALYTICAL INSTRUMENTS

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The New Zealand Institute of Chemistry Incorporated

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The most common feedback centres around: the high pump performance, especially noticeable in low flow and microbore gradient applications and in use with pulse sensitive detectors; the dramatic increase in detector sensitivity and the convenience and utility of wavelength programming and dual wavelength/ratio modes; the simplicity and power of the auto-injector and the seamless way all the system modules can function together in whatever configuration a user wants or needs.

The advanced autosampler and flow switching control capabilities allow sophisticated pre and post column derivatisation and automatic sample pretreatment and preconcentration. These combined with novel derivatisation chemistries developed at Shimadzu's application laboratories further enhance the sensitivity and selectivity of HPLC for a wide range of target compounds.

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A comprehensive product offering, a wealth of applications information and expertise, excellent connections with local and overseas authorities in separation science and a genuine interest in solving your separation problems and suggesting appropriate solutions to your application needs, make Douglas Scientific the people to call for all your chromatography needs. For further product details circle number 28 on the reader reply card.

NEW ZEALAND COMPANY AND INDUSTRY NEWS

New Milk Powder Factory at Waitoa

New Zealand Dairy Group's Anchor subsidiary will build a new \$100 million milk powder factory at its Waitoa site near Morrinsville. The new factory is expected to start production

late in 1994 and will be built on land adjoining the current Anchor Products factory producing cheese, baby food and nutrition supplements.

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PEOPLE WATCH

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Ian Hickling, formerly at Douglas Pharmaceuticals, Auckland, is now Quality Assurance Manager at Nufarm Ltd, Otahuhu, Auckland.

Joanne Sainsbury, formerly at Wiltons Instruments, Auckland, is now Sales Representative for Watson Victor Ltd, Auckland.

Susan Whineray has recently returned from overseas and has joined LabSupply Pierce Ltd as Sales Representative for medical laboratories. Susan is based in Auckland.

Elaine Fong recently joined LabSupply Pierce Ltd's Christchurch office in a customer service role.

Richard Keene, formerly at Glaxo Pharmaceuticals, Palmerston North, is now Production Manager at Nufarm Ltd, Otahuhu, Auckland.

Dr. Margaret Brimble, formerly at the Chemistry/Biochemistry Dept., Massey University is now a lecturer in the Chemistry Dept., University of Auckland.

Dr. Brent Copp formerly of the Department of Natural Products, Xenova Ltd, Flough, England has joined the Chemistry Dept. University of Auckland as a lecturer in Organic Chemistry.

NEW DAIRY INDUSTRY CODES OF PRACTICE AND TECHNICAL MANUALS

by R. I. Hall, Quality Consultant (Industry) with the N.Z.
Dairy Board, Wellington.

This paper describes the development of the new dairy industry codes of practice and technical manuals. It also describes the responsibilities of industry and MAF since 1990 and the part that quality systems and TQM play in the management of food safety and truth of labelling (regulatory matters) in the NZ dairy industry.

Background

The NZ dairy industry has for many years focused on quality and taken a quality management approach to managing food safety and truth of labelling. The introduction of the Dairy Industry Regulations in 1990 caused major shifts in responsibilities and enabled the industry to make full use of its quality management approach.

Structure of the Regulations

The regulations apply to export and domestic dairy products - including market milk - and place the responsibility for food safety and truth of labelling on the industry. They contain outcome standards, rather than detailing how to achieve the outcomes, and provide the industry flexibility in how it achieves the outcomes. Dairy products must be manufactured in

registered premises and the manufacturer must operate an approved product safety programme. MAF Regulatory Authority monitors the level of industry conformance to the outcomes standards.

The registration and approval are given by the Director General of MAF through the Chief Dairy Officer. Registration applies to laboratories, stores and processing premises. Product Safety Programmes must cover: milk production, storage and transport; manufacture, transport and storage of dairy products; the keeping of records and the sampling, examination and testing of dairy products.

The regulations allow the Director General to issue circulars setting out specific criteria that will satisfy, or meet with the approval of, the Director General. It is through this mechanism that the dairy industry's codes of practice and technical manuals gain MAF Regulatory Authority approval; if dairy companies satisfy the codes they are deemed to have satisfied the regulations. Most dairy companies cite the codes of practice and technical manuals in their Product Safety Programmes.

Infrastructure for the Management of Regulatory Matters

A close liaison between MAF Regulatory Authority, dairy industry sectors and the Board is essential to developing and maintaining the integrity of the dairy industry programmes for the management of regulatory matters.

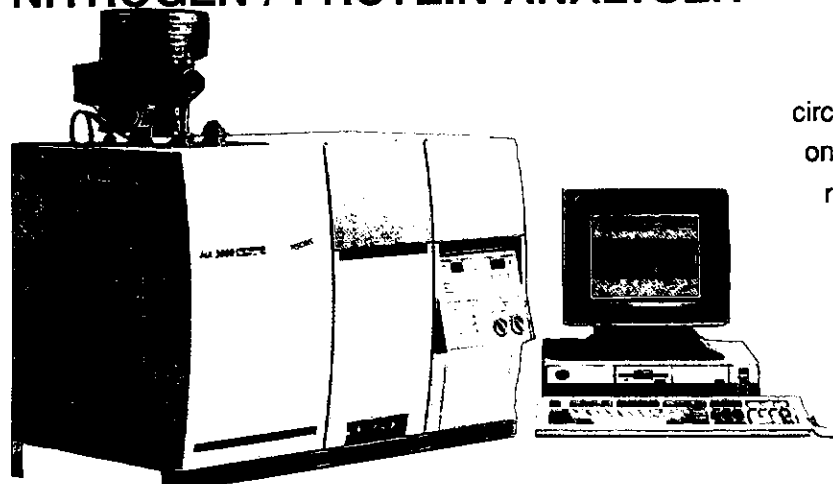
To achieve the necessary level of liaison and to ensure all parties (MAFRA, Dairy Board and dairy industry sectors - including town milk, small cheese makers, and goats milk

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producers) were adequately involved, a series of committees and working groups were established with specific briefs. These committees and working groups continue to meet on an as needed basis and are the key mechanism for resolving industry wide issues and for developing standards and codes. They also fulfil an important communication role.

Total Quality Management

The industry's quality management programme has three principal components: compliance with food safety and regulatory requirements; the implementation of quality systems to internationally recognised quality systems standards (eg. the ISO 9000 series standard); and continuous improvement of all business processes in relation to products and services.

All dairy companies and Dairy Board divisions are working towards certification to ISO 9000 series standard by the end of 1993. Many have already achieved certification. While adherence to the standard is becoming an increasingly common customer expectation, considerable emphasis is given to ensuring that systems are developed in such a way that they are of maximum benefit to the industry in understanding and controlling the many processes involved. For instance, dairy companies integrate their Product Safety Programmes into their quality systems and MAFRA acknowledges the value of quality systems in monitoring each company's conformance with the regulations.

The Dairy Board and industry recognise the needs to go beyond the quality systems currently underpinning its business by embracing the principles of Total Quality Management.

New Dairy Industry Codes of Practice and Technical Manuals

An ambitious industry programme to develop or review a set of nine codes of practice and six technical manuals was started in 1991 and will be completed this year. Most codes and technical manuals were previously managed by MAF.

The codes of practice describe the minimum standards that are sufficient to satisfy the regulatory outcome standards. They cover all aspects of the dairy industry operations from milk production through milk processing, transport, storage and testing. Included are codes of practice on milk production, equipment design and approval, manufacturing premises design and approval, dairy product safety standards, traceback procedures and validation of test methods.

The technical manuals are laboratory focused and contain chemical, physical, functional, sensory and microbiological test methods used for the analysis of dairy products.

The codes and manuals are widely distributed amongst the dairy industry and providers of services to the dairy industry. For example, the Farm Dairy Code of Practice print run was 18,000 and virtually every dairy farmer in New Zealand has a copy.

Described in the next article is the development of the Dairy Microbiology Manual. It is typical of the process used in the development of all the technical manuals.

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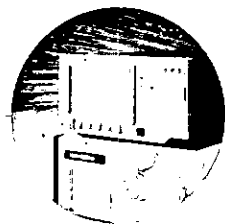
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The NZ dairy industry has for many years focused on quality and taken a quality management approach to managing food safety and truth of labelling. The introduction of the Dairy Industry Regulations in 1990 caused major shifts in responsibilities and enabled the industry to make full use of its quality management approach.

Structure of the Regulations

The regulations apply to export and domestic dairy products - including market milk - and place the responsibility for food safety and truth of labelling on the industry. They contain outcome standards, rather than detailing how to achieve the outcomes, and provide the industry flexibility in how it achieves the outcomes. Dairy products must be manufactured in

registered premises and the manufacturer must operate an approved product safety programme. MAF Regulatory Authority monitors the level of industry conformance to the outcomes standards.

The registration and approval are given by the Director General of MAF through the Chief Dairy Officer. Registration applies to laboratories, stores and processing premises. Product Safety Programmes must cover: milk production, storage and transport; manufacture, transport and storage of dairy products; the keeping of records and the sampling, examination and testing of dairy products.

The regulations allow the Director General to issue circulars setting out specific criteria that will satisfy, or meet with the approval of, the Director General. It is through this mechanism that the dairy industry's codes of practice and technical manuals gain MAF Regulatory Authority approval; if dairy companies satisfy the codes they are deemed to have satisfied the regulations. Most dairy companies cite the codes of practice and technical manuals in their Product Safety Programmes.

Infrastructure for the Management of Regulatory Matters

A close liaison between MAF Regulatory Authority, dairy industry sectors and the Board is essential to developing and maintaining the integrity of the dairy industry programmes for the management of regulatory matters.

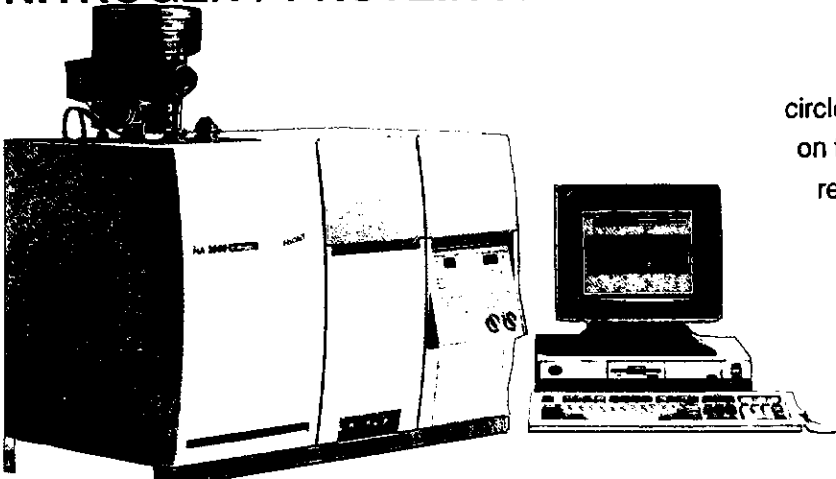
To achieve the necessary level of liaison and to ensure all parties (MAFRA, Dairy Board and dairy industry sectors - including town milk, small cheese makers, and goats milk

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producers) were adequately involved, a series of committees and working groups were established with specific briefs. These committees and working groups continue to meet on an as needed basis and are the key mechanism for resolving industry wide issues and for developing standards and codes. They also fulfil an important communication role.

Total Quality Management

The industry's quality management programme has three principal components: compliance with food safety and regulatory requirements; the implementation of quality systems to internationally recognised quality systems standards (eg. the ISO 9000 series standard); and continuous improvement of all business processes in relation to products and services.

All dairy companies and Dairy Board divisions are working towards certification to ISO 9000 series standard by the end of 1993. Many have already achieved certification. While adherence to the standard is becoming an increasingly common customer expectation, considerable emphasis is given to ensuring that systems are developed in such a way that they are of maximum benefit to the industry in understanding and controlling the many processes involved. For instance, dairy companies integrate their Product Safety Programmes into their quality systems and MAFRA acknowledges the value of quality systems in monitoring each company's conformance with the regulations.

The Dairy Board and industry recognise the needs to go beyond the quality systems currently underpinning its business by embracing the principles of Total Quality Management.

New Dairy Industry Codes of Practice and Technical Manuals

An ambitious industry programme to develop or review a set of nine codes of practice and six technical manuals was started in 1991 and will be completed this year. Most codes and technical manuals were previously managed by MAF.

The codes of practice describe the minimum standards that are sufficient to satisfy the regulatory outcome standards. They cover all aspects of the dairy industry operations from milk production through milk processing, transport, storage and testing. Included are codes of practice on milk production, equipment design and approval, manufacturing premises design and approval, dairy product safety standards, traceback procedures and validation of test methods.

The technical manuals are laboratory focused and contain chemical, physical, functional, sensory and microbiological test methods used for the analysis of dairy products.

The codes and manuals are widely distributed amongst the dairy industry and providers of services to the dairy industry. For example, the Farm Dairy Code of Practice print run was 18,000 and virtually every dairy farmer in New Zealand has a copy.

Described in the next article is the development of the Dairy Microbiology Manual. It is typical of the process used in the development of all the technical manuals.

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DR PEAK'S CHROMATOGRAPHY MADE EASY

HOW TO OPTIMISE TEMPERATURE PROGRAMMING

Temperature programming in gas chromatography reduces elution times which is particularly useful when samples contain components with a wide range of volatilities. When the temperature of the column is changed the analyte order and resolution are changed. The skill of the analyst is to optimize the temperature programme to reduce run time while maintaining resolution.

A SIMPLE MODEL

To model the elution of an analyte under a temperature programme it is possible to use a spreadsheet (1).

The procedure is to assume that the temperature programme proceeds in a set of discrete steps and calculate how far along the column each analyte has travelled. When the distance travelled exceeds the column length the analyte has been eluted. The calculation is carried out by taking the retention time for an unretained analyte and measuring the retention times for the analyte of interest at two temperatures. For example on a 10m column if the elution time for an unretained analyte (t_M) is 0.5min and the elution times for a retained analyte (t_R) are 10min at 50°C and 7min at 60°C then the capacity factors (k) for the two temperatures are 19 and 13 respectively using:

$$k = (t_R - t_M)/t_M$$

From this it is possible to calculate the capacity factors for that analyte at any (absolute) temperature (T) using:

$$\log k = (A/T) + B$$

From the capacity factors the retention times for the analyte can be calculated at any temperature. The coefficients A and B can be calculated using the temperature and capacity factor data for 50°C and 60°C.

To follow the analyte through the column we can imagine the temperature programme runs for a minute at 50°C then a minute at 60°C then a minute at 70°C and so on. In the first minute at 50°C for an elution time of 10min and a column of 10m the analyte must travel 1m. In the second minute for an elution time of 7min the analyte must travel 1.4m. So over the first two minutes the analyte will travel 2.4m. We can add on minutes until the distance travelled is greater than 10m.

TABLE I: Predicted Retention Behaviour for Stepwise Temperature Programming

Time (min)*	Temperature (°C)	Capacity Factor**	Retention Time (min)**	$z_i(m)$ ***
0.0	50.0	19.0	10.0	1.0
1.0	60.0	13.0	7.0	2.4
2.0	70.0	9.1	5.0	4.4
3.0	80.0	6.5	3.7	7.1
4.0	90.0	4.7	2.9	10.6

* Elapsed time at the beginning of each temperature step.

** Calculated for isothermal elution.

*** Distance traveled by the analyte at the end of the temperature step.

If this is carried out on a spreadsheet the results will resemble table I.

Naturally this calculation with the discrete steps is a rather crude attempt to describe a real process in which the temperature is increasing smoothly at a rate of 1°C per minute. However once the spreadsheet is set up it becomes a relatively simple task to reduce the time intervals and the size of the temperature increments. With increments of 0.1°C and time intervals of 0.6s the spreadsheet model becomes sufficiently close to be indistinguishable from that using an integral approach.

From table I it can be seen that with the temperature programme the analyte is eluted in a little over 4min which is about 40% of the time taken at 50°C isothermally. This becomes more apparent with a longer column where the final temperature would be higher. In terms of run time there is a loss due to the time to cool the column but this is relatively small compared to run times with longer columns.

THE QUESTION OF RESOLUTION

The most important factor in analysis of mixtures by gas chromatography is the resolution of the components on the chromatogram. This must be maintained while the run time is reduced. If a minimum resolution of 1.5 is considered acceptable then for a mixture of two analytes it is possible to run through the spreadsheet model using data for the two components to find a temperature programme for which run time is a minimum and the resolution is maintained.

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For more complex mixtures this procedure becomes too laborious and it is easier to carry out runs at a variety of temperature programme rates and then represent the resolution pictorially to achieve an overall compromise.

For example a pesticide calibration mixture was run at several temperature programme rates and the results are shown in figure 1. Of particular interest are the behaviour of peaks E and F, J and K and P and Q. Figure 2 is a two dimensional representation of the three dimensional graph of resolutions against programme rate for each adjacent peak pair. However we do not need to plot the resolutions as we are only interested in the programme rate at which the resolution become unsatisfactory. This is represented by the shading.

Clearly from figure 2 there is no programme rate at which full resolution is achieved for all pairs. However, at 8°C/min all pairs are at least partially resolved.

DR PEAK'S CHROMATOGRAM OF THE MONTH

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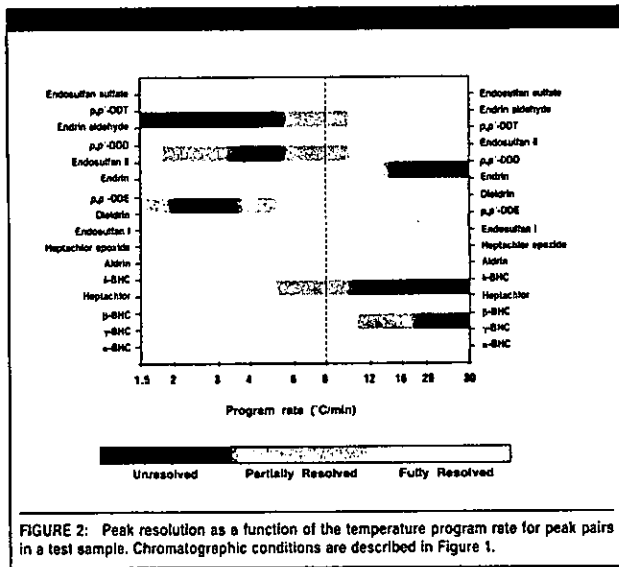


FIGURE 2: Peak resolution as a function of the temperature program rate for peak pairs in a test sample. Chromatographic conditions are described in Figure 1.

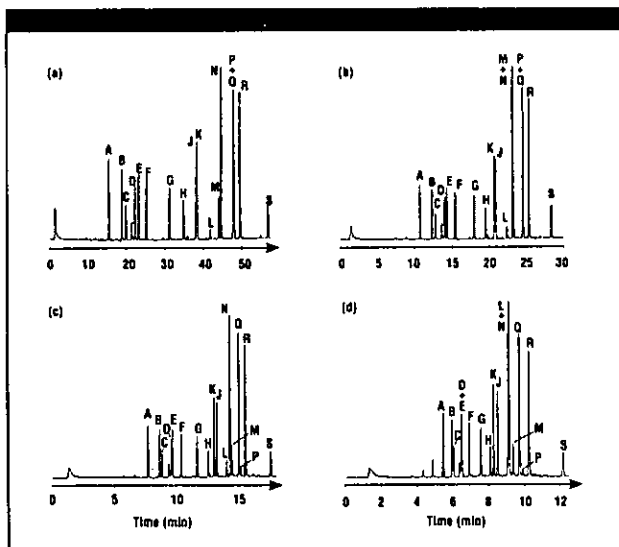


FIGURE 1: Separation of a mixture of chlorinated pesticides at program rates of (a) 1.5, (b) 4.0, (c) 8.0, and (d) 16.0 °C/min. Column: 25 m x 0.53 mm methyl-35% phenylsilicone fused silica; carrier gas (flow controlled): helium, 3.5 mL/min; temperature program: 50-275 °C; injection method: direct, 300 °C; detection: electron capture, 350 °C; sample: 0.5 μL of 60-200 pg/μL of each component in methanol. Peaks: A = α-BHC, B = γ-BHC, C = β-BHC, D = heptachlor, E = δ-BHC, F = aldrin, G = heptachlor epoxide, H = endosulfan I, J = dieldrin, K = p,p'-DDE, L = endrin, M = endosulfan II, N = p,p'-DDD, P = endrin aldehyde, Q = p,p'-DDT, R = endosulfan sulfate, S = decomposition product.

CONCLUSION

The use of computer simulations can give clear information to enable the choice of optimum temperature programme rates but for very complex mixtures visual resolution maps can allow a more rapid choice of a suitable compromise.

(1) RG Williams and HD Mitchell, *J Chromatogr.* 541, 59-74 (1991)

Adapted from:

"Programmed - Temperature Optimization"

LC • GC Volume 9 Number 7 (1991)

by John V Hinshaw

Principal Scientist

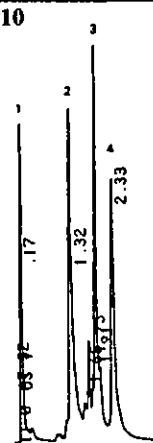
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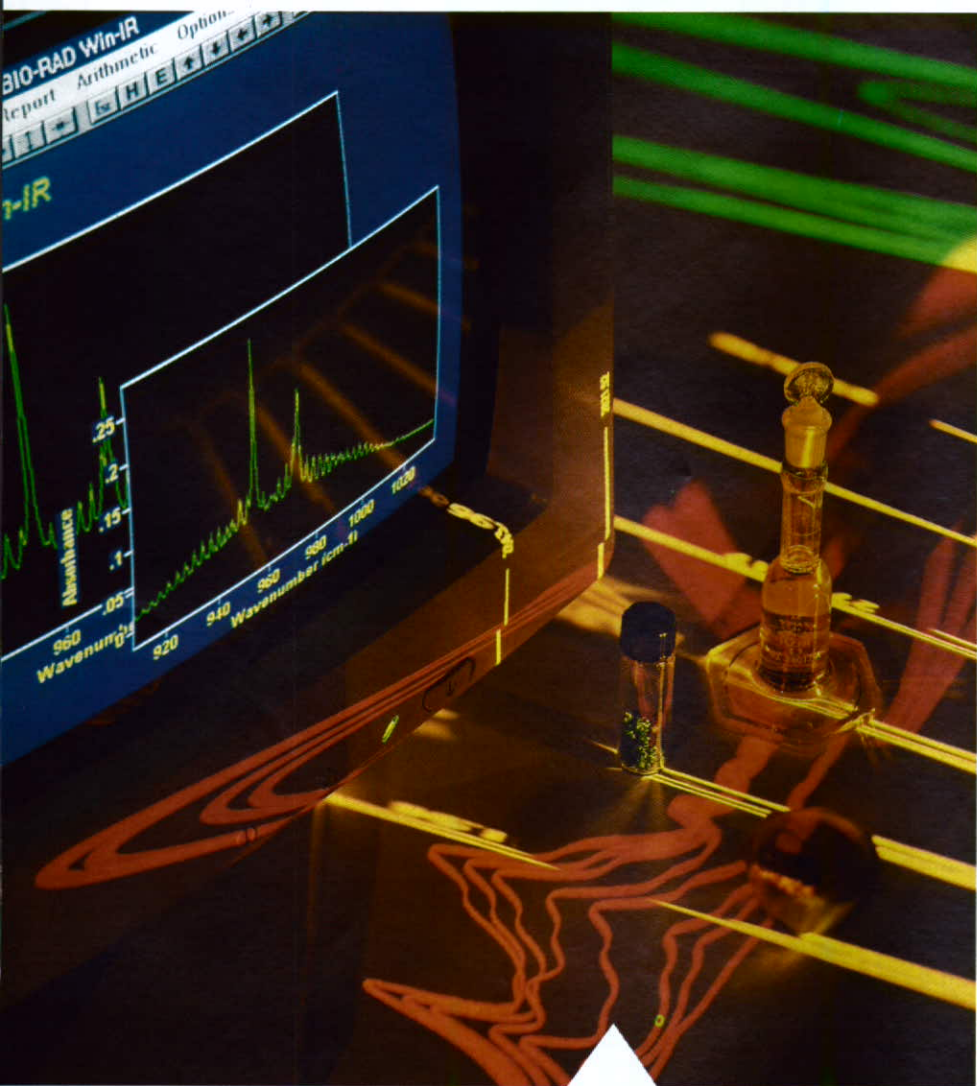
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News From Across the Ditch

1994 AUSTRALIA PRIZE - NOMINATIONS CALLED

Nominations for the 1994 Australia Prize have now been called. The prize will be awarded in the field of Sustainable Land Management. Among the topics this field embraces are hydrology, water quality, pest control, farm size, soils, climate prediction, sustainable agricultural projects and total catchment management.

The Australia Prize is an international award for an outstanding specific achievement in a selected area of science and technology promoting human welfare. It has been awarded annually since 1990 and comprises a cash award of A\$250,000 together with an inscribed medal.

The 1993 Australia award in sensory perception was recently awarded jointly to Professor Horace Barlow of Cambridge University, U.K.; Professor Peter Bishop of the University of Sydney, Australia; and Professor Vernon Mountcastle of John Hopkins University School of Medicine, U.S.A., for their contributions to our understanding of the workings of the brain and the senses of sight and touch.

For those interested in nomination for the 1994 Australia Prize, conditions of Award and Nomination Requirements are available from Mr. Alan Turner, Executive Officer - NZIC, P.O. Box 12-347, Wellington.

Australian Thermal Analysis Society (ATAS)

ATAS is initiating activities which include:

(i) a one day symposium on Thermal Methods of Analysis to be held on 30 September, 1993, in Perth, as part of 12AC. Speakers include Professor Ted Charsley (Trends in Thermal Analysis Methods), Professor S. Warne (Coals and Oil Shales), Professor D. Dollimore (Cement, Glass and Ceramics), D. J. Hill (Education) and Associate Professor J. Dunn (Materials).

(ii) Efforts are being made to form a RACI National Special Interest Group in Thermal Analysis. For further details contact Associate Professor Jeff Dunn (President, ATAS) School of Applied Chemistry Curtin University of Technology. Ph 61-9-3517221, Fax 61-9-3512300.

RACI Chemical Education Division Award Nominations

The Chemical Education Division of RACI has called for nominations for the 1993-94 Chemical Education Medal and for the Chemical Education Citations for 1993. Further information can be obtained from Associate Professor David Clift, RACI Chemical Education Division, Department of Science, Deakin University, Rusden Campus, 662 Blackburn Road, Clayton, Victoria 3168, Australia.

RACI New Address

The RACI National Secretariat and RACI Victorian Branch offices are now located at:

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UNESCO Membrane Centre for University of NSW

A UNESCO Centre for Membrane Science and Technology will be established at the University of New South Wales in Sydney. This will be the first UNESCO Centre in Australasia and the aim will be to promote the application of membrane science and technology to improve the environment and the quality of life particularly in developing countries. The joint directors of the centre are Professor Hans Coster and Professor Tony Fare. (Chemistry in Australia, Feb. '93).

New Medicinal Plant Constituent Centre at La Trobe University

The Asian-Australian Centre for the study of Bioactive Medicinal Plant Constituents has been formed at La Trobe University in Melbourne. Key staff at the centre are chemist Dr. B. Ternai (FRACI) and biochemist Dr. G. Polya. Successful projects so far include the development of a method to isolate pure sterioside from the Paraguayan Sweet Tea grown in Thailand. Sterioside is rated as 300 times as sweet as sucrose. Another project involves extraction of a tropical fruit which provides protection from "gout" and assists lactation of nursing mothers. The Thai government has funded a new building at Chulalongkorn University in Thailand for the centre.

(Chemistry in Australia, Feb. '93).



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GBC Scientific Equipment and ICI Instruments have announced that their operations are being merged.

GBC, which is celebrating its 15th anniversary in 1993, is a leading manufacturer of atomic absorption, UV-visible and inductively coupled plasma spectrometers. The company was founded by three instrument engineers, and started out by making the world's smallest and lowest cost atomic absorption spectrometers.

GBC now manufactures a complete range of AA equipment, from simple, low cost instruments to fully automatic computer-controlled instruments. It also has five UV-visible models, ranging up to a full double monochromator, double beam unit, and four ICP models (sequential, dual channel, simultaneous and simultaneous/sequential).

In recent years, GBC has maintained an average annual growth rate of 50% and its products are currently sold in over 70 countries worldwide.

ICI Instruments was established in 1984 to manufacture and market scientific instruments. Its major activity has been the design, manufacture and marketing of HPLC equipment.

Up until now, GBC and ICI have operated separate design, manufacturing and marketing organisations. The merger of the two companies is expected to produce major benefits in improved manufacturing efficiency and in the integration of worldwide marketing operations.

The merged organisation will operate from the existing GBC facility in Dandenong, Victoria, and the full range of AA, UV-Vis, ICP and HPLC equipment, will be sold under the GBC name. ICI Australia will retain its 50% share of GBC Scientific Equipment.

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ICI Instruments has been operating an Australian-wide sales and service operation. This organisation has been handling HPLC, the full GBC range, and a number of imported lines, including Setaram, Bohlin and Dani. GBC will continue this operation and will be looking to expand it with the addition of new agencies.

The Australian and New Zealand scientific community will benefit by being able to buy a full range of AA, UV-Vis, ICP and HPLC equipment directly from the manufacturer.

GBC Scientific has been represented by ICI Instruments (NZ) Ltd for the last 4 years. There will be no change apart from the name - to GBC Scientific (NZ) Ltd - to the support provided in N.Z.

For further details please contact: David Payne, GBC Scientific, Ph. (09) 373 5765, P.O. Box 68-330, Auckland.



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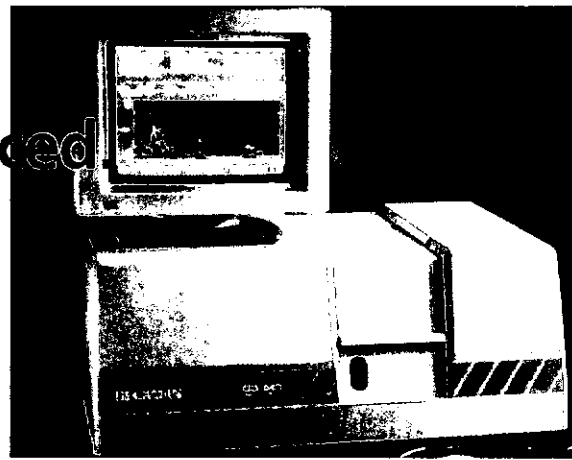
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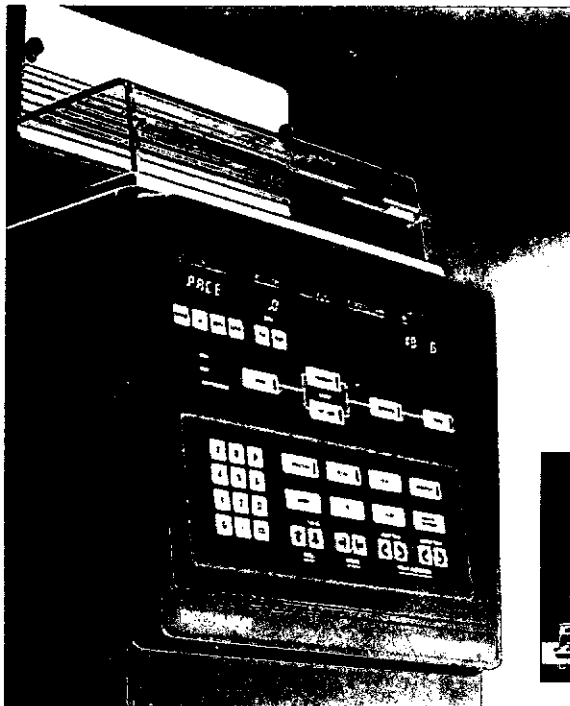
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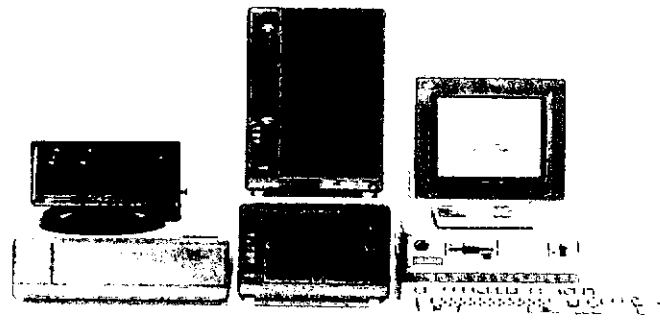
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International News

International Union of Pure and Applied Chemistry (IUPAC)

DESTRUCTION OF CHEMICAL WARFARE AGENTS

The first meeting of the IUPAC Task Force on Scientific Aspects of the Destruction of Chemical Warfare Agents was held 22-24 February, 1993. Experts from France, Germany, Italy, Poland, Russia, UK and USA attended the meeting which was hosted by the Chemical and Biological Defence Establishment (CBDE), Porton Down, near Salisbury, UK. The meeting was co-chaired by Prof. Joseph Bunnett (University of California, USA) and Mr. Ron Manley (CBDE).

The Task Force is seeking to:

- (i) identify scientific questions related to the destruction of chemical warfare agents that need further investigation by research;
- (ii) obtain and disseminate information about potential destruction processes.

It aims to help authorities faced with chemical munitions destruction problems. The work of the Task Force will include site visits to mustard and nerve gas 'warehouses', to existing installations used for their destruction, and to pilot plants of similar purpose.

A Task Force INFORMATION STATEMENT is available from the IUPAC Information Officer at the address below.

News of the Task Force activities will be published in the IUPAC news magazine *Chemistry International*.

The Task Force will publish its findings and recommendations in the IUPAC journal *Pure and Applied Chemistry*.

Further information from:

Dr. Michael Freemantle, Information Officer,
IUPAC Secretariat, Bank Court Chambers,
2-3 Pound Way, Templars Square, Cowley,
Oxford OX4 3YF, UK.

Ph: +44 (865) 747744,

Fax: +44 (865) 747510.

Telex: 83147 VIA OR G attn. IUPAC.

E-mail: IUPAC@VAX.OXFORD.AC.UK.

TopoMetrix and Hitachi Announce Joint Development Programme for SEM/SPM

Santa Clara, California - TopoMetrix Corporation has announced that it has signed an agreement with Hitachi Ltd. (Tokyo, Japan), to co-develop scanning probe microscope (SPM) products for use in Hitachi scanning electron microscopes (SEMs).

SPMs provide the ability to image samples in three dimensions at very high resolution. They are complementary to scanning

electron microscopes, in that SEM instruments can be used to select areas of the sample surface for SPM analysis and the SPM can be used to quantify height changes. SPM can also be used to image samples that are difficult for SEM, such as insulating polymers and films.

Dr. Gary Aden, TopoMetrix' President and Chief Executive Officer, commented that "we view the SPM as an important complement to the electron microscope. Hitachi is a premier SEM manufacturer, and we are pleased to be working with them on this project."

TopoMetrix designs and manufactures scanning probe microscopes for worldwide distribution. Scanning probe microscopes are used by industry, government, university, and research laboratories to characterise materials by providing extremely high-resolution three-dimensional images of surfaces. This rapidly growing technology builds upon the Nobel-prize-winning invention in 1981 of the scanning tunnelling microscope and its ability to image individual atoms.

Technical Contact: Dr. Gary Aden, TopoMetrix, Ph. (408) 982 9700, Fax (408) 982 9751.

Perkin-Elmer and Dow Chemical Company Form Alliance to Advance Real-time Analytical Instrumentation

The Perkin-Elmer Corporation and The Dow Chemical Company announced that they have entered into a strategic alliance to jointly develop and commercialise technology and globally market systems for real-time analysis. The business formed as a result of this alliance will be operated as a division of Perkin-Elmer and will include existing and future technology from both companies. This division will have dedicated management and support services.

The objective of the alliance between Perkin-Elmer and Dow is to establish a long-term partnership in order to extend the practical use of advanced analytical technology into applications of real-time industrial and environmental monitoring. By combining efforts, the companies expect to accelerate development activities, create a strong identity in the marketplace and leverage existing technology into numerous application areas.

Both Perkin-Elmer and Dow have identified real-time analysis as a major growth opportunity. Real-time analysis systems incorporate sampling and data handling features that are not readily available today in traditional laboratory instruments. Driven by factors such as compliance, productivity, safety, costs, and quality, industries are changing their analysis requirements and citing the need for more rugged, portable, continuous-monitoring instruments to be used on-line or in the production process.

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DAIRY INDUSTRY DETERGENTS

"FACTS versus FICTION"

by L.A. Campbell,
Pharmaceutical Chemist, MNZIC, M.P.S.
Hi-Tech Detergents Ltd

One of the intriguing occupations is that of the "detergent chemist".

Some of us are seen as mysterious mad scientists, who readily trial all kinds of concoctions through bright shiny machinery, nicely located within dairy company manufacturing facilities. Others are seen as high pitched salesmen who if interrupted in their portrayal of their products, become flustered and turn a nice shade of red. These fellows are usually well primed in the "art of selling" and give a textbook performance.

What then, are "THE FACTS?"

Three basic chemicals have been used for years in the cleaning of dairy machinery

- * Water
- * Sodium Hydroxide
- * Nitric Acid

The most powerful solvent is water, and indeed, without it, cleaning would not be possible.

Sodium Hydroxide has been the favoured chemical for removal of milk proteins and fats.

Nitric Acid is the preferred choice for milkstone, (milkstone being a mixture of Calcium Phosphate, protein, fat and other minerals).

A bonus with Nitric Acid is its passivating effect on stainless

steel (helps stop corrosion of stainless steel). What other factors can we introduce into the cleaning regime, to enable a quicker more efficient clean?

Proteins need to be split at the carboxyl amide bond, so that they are more readily removed. Fats require temperature, and detergency to enable emulsification and dispersing. Mineral deposits may be more easily dispersed and dissolved, with the addition of surfactants, and crystal modifiers, or chelators.

One group of the chemicals available is the surfactants, (just a shortening of the words surface active agents)

Three ionic types are available:

- * anionic - carry a negative charge
- * non ionic - carry no charge
- * cationic - carry a positive charge

For detergency, anionic and non ionic are preferred.

Cationics are the fabric softeners, and metal protection agents, hair conditioners, etc.

The purpose of surfactants is to lower surface tension, this enables penetration of the soil. Dispersing of fats and solubilisation are other important factors.

Chelators, and sequesterants, eg. EDTA, NTA, Sodium Gluconate, Phosphonates like Dequest 2000, all act to neutralise the effects of Calcium, Ca^{2+} , Magnesium, Mg^{2+} , Iron, Fe^{2+} and Fe^{3+} and to a lesser extent other cationic mineral ions.

The problem is, that not one chelator or sequesterant, is specific to the total range of cations, so mixtures may be necessary. These chemicals are excellent at stopping the cations from interfering with surfactants, and alkaline cleaning detergents, and help stop redeposition of insoluble mineral salts, onto the stainless steel.

Another group of anti-redeposition agents is the polyacrylates. These have a varying range of molecular weights (in the thousands) and can be specific depending on molecular weight for the job they do.

Alkaline cleansing, with straight Sodium Hydroxide, (Caustic Soda) has a number of disadvantages where protein, especially heat treated protein is concerned.

Maillards Reaction or the browning reaction of proteins is well known and documented. Its complex pathway to the formation of brown pigmented melanoidins is still not fully understood, but causes taints and off flavours in milk products. This same reaction also occurs with the use of straight Sodium Hydroxide as a protein remover, especially in evaporators under Clean In Place (CIP) conditions.

The gelling of the protein, increased viscosity of the cleaning solution's impervious film formation on the protein substrate surface (most pronounced with caseinates), causes the cleaning cycle to be long, and may even block partially open tubes in the evaporator, necessitating them to be "pushed" clear with rods and brushes.

The longer the CIP regime continues, then Maillards Reaction becomes predominant and the caramelised, brown, burnt smell of the proteins and sugars, is evident.

Large gelatinous impervious pieces of protein, also tend to break off the tubes and block distributor plates that feed tubes with cleaning solution.

How can we overcome the above problems?

Purpose built detergent mixtures, containing

1. Caustic
2. Surfactant
3. Chelator



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4. Sequesterant
 5. Anti Maillards Reaction chemical
- are required to give,
1. a more efficient clean
 2. a quicker CIP turn around time
 3. no off flavours left in the machine

Most chemical companies have incorporated 1,2,3, and 4 in their formulations.

Only Hi-Tech Detergents Limited has found the answer to the number 5 chemical. This is unfortunately still a "trade secret".

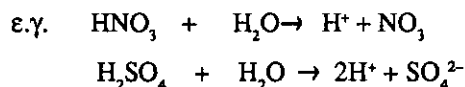
Acids

As mentioned earlier, acid cleaning has been predominantly Nitric Acid.

There are however, a disturbing number of mixtures now on the market.

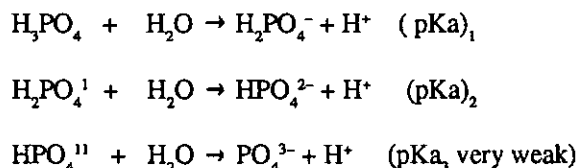
Are there any benefits to mixtures of different acids? For this answer, I will leave you to draw your own conclusions from the following information.

Strong acids, such as Nitric, Sulphuric, Hydrochloric, virtually totally dissociate into their cation and anion components when dissolved in water.



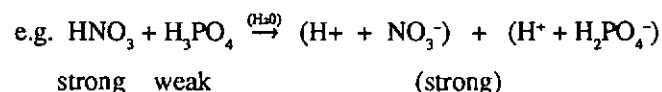
The reaction is strongly to the right (concentrated Sulphuric Acid 98% w/w can be stored in steel containers, because it does not dissociate until water is present).

Weaker acids, such as Phosphoric Acid do not so readily dissociate



pKa1 and pKa2 readily titratable and are near enough to the total acid content of the Phosphoric Acid. In the presence of a stronger acid, that is by introducing H+ ions, the Phosphoric Acid reactions are driven to the left.

Let us consider a mixture of Nitric and Phosphoric Acid



The chemical equations and mathematics for the above reaction is substantial, but the answer is that only 2% of the Phosphoric Acid, is allowed to dissociate into H+ + H₂PO₄⁻, i.e., it virtually stays as pure undissociated Phosphoric Acid.

In cleaning solutions of these mixtures, the acid is NEVER TOTALLY SPENT, or IS NEVER NEUTRALISED.

Only if totally neutralised, would the Phosphoric Acid dissociate completely. This total dissociation does not happen in the cleaning of dairy equipment, because the acid solutions are always in the acid state.

Pure undissociated Phosphoric Acid, (acid that has taken no part in the cleaning solution) is being dumped to the drain. Consider here the waste of money and cost to the environment. Similar calculations for mixtures of Sulphuric Acid or Nitric Acid and Phosphoric Acid, show similar results, i.e., Phosphoric Acid is virtually undissociated and is dumped to the drain in an unused state.

Nitric / Surfactant Blends

For removal of milkstone deposits, the addition of a surfactant to the Nitric Acid is beneficial. Lowering of surface tension, absorbance into the soil substrate, all benefit in a more efficient, quicker clean, when surfactant is present.


Lowering of surface tension from 70 dynes to about 28 dynes, is possible with the addition of a Fluorosurfactant into the concentrated Nitric Acid. Normal addition rates of surfactant are as low as 0.1%. Further, it has been found that lower use rates can be used, reductions of 30% v/v are possible, and this benefits in lower nitrate levels being put as waste into the waterways, and of course a lower cost factor.

To summarise: **FACTS:**

1. Detergent mixtures are beneficial, if a high enough percentage of additives are used
2. Maillards Reaction is a problem in heat treated milk processing machinery
3. A greater understanding of acid mixtures is required
4. Manufacturing companies producing milk products should understand more fully the chemical requirements for their factories. This can only be obtained by honest assessment and with full understanding of what is available. This will require the full co-operation from detergent manufacturers.

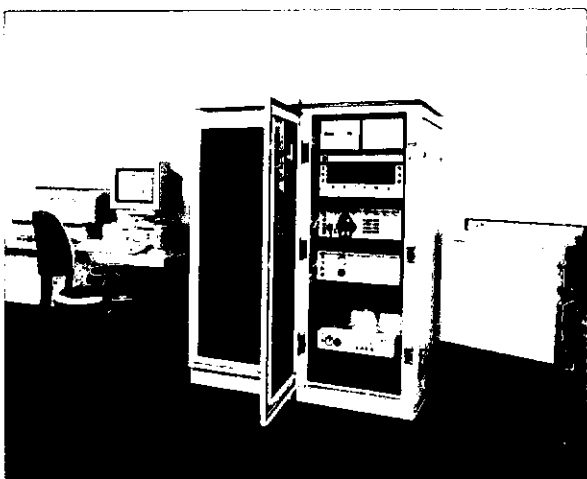
FICTION:

1. All detergents are "the same?"
2. Mixtures of some acids work better?
3. Straight caustic is all you need?
4. The browner the cleaning solution, the better the detergent worked?




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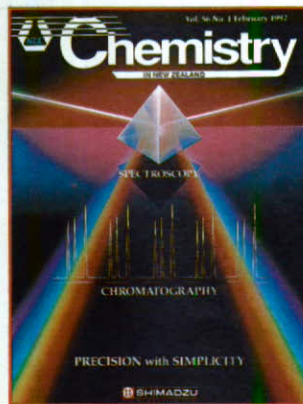
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NIR PROCESS MONITORING FOR THE DAIRY INDUSTRY

by: Glenn Grayston, NIR Product Specialist,
SCI TECH
Science & Technology (NZ) Ltd

As part of the increasing momentum towards rationalised testing, Fast Scanning Near Infrared Spectroscopy is an obvious technique for investigation of on-line monitoring and process control in the dairy industry.

NIRS offers real-time monitoring of constituent composition with results available in most processes every 45 seconds to two minutes depending on the amount of signal averaging required. 4 - 20 milliamp or RS-232 feedback loops are possible for interactive plant control using the existing PLC systems.

Traditional wet chemistries can take many hours to get a result and, as an alternative in the laboratory, NIRS has been widely accepted for products such as milk powder and butter using NIR filter instruments. However, with increasing automation and computer-based process control, even the speed of lab based systems are failing to provide the necessary information required.

PRINCIPLES OF NIR

Infrared radiation (IR) from that part of the spectrum nearest visible light (hence 'near infrared') illuminates the sample to be analysed. After the light interacts with the sample, IR is collected. The IR is changed through interactions with the

sample, specifically, interactions with various functional groups such as O-H, N-H, C-H which correspond to moisture, protein and fat. The degree of IR absorbance by functional groups at specific wavelengths can be correlated with the concentration of constituent components in the sample.

CALIBRATION

NIRS is a secondary technique requiring calibration against the standard laboratory method. Between 20 - 50 samples are required depending on the number of constituents to be monitored and the sample variation. These samples are manually analysed and correlated with the NIR raw data so direct measurements of the constituents can be made by the instrument. The new generation of fast scanning NIR's have very high wavelength accuracy and precision which allow calibrations to be transferred between instruments with little or no adjustments.

Calibration precision can be as high as 0.01% whereas the accuracy is directly related to the standard laboratory method.

NIR ADVANCES

Advances in high speed computing, fibre optics and standardised network communications are opening up new applications to NIR technology. In the dairy industry virtually every product has been tried either directly on-line, at-line or in the laboratory. Products such as milk, butter, milk powder and whey protein have all been successfully monitored in real-time, using fibre optic probes in transmission or reflectance mode. Cheeses and just about every specialist dairy product are now being monitored using laboratory based instrumentation. NIR continues to promote the drive towards more tightly controlled compositional uniformity.

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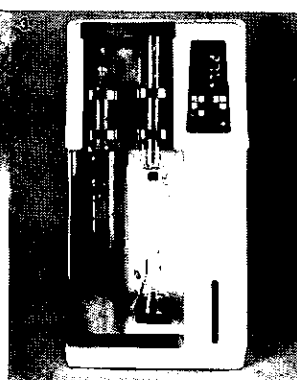
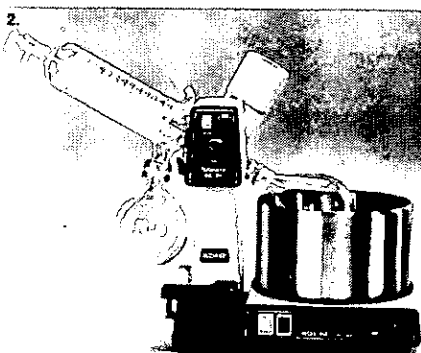
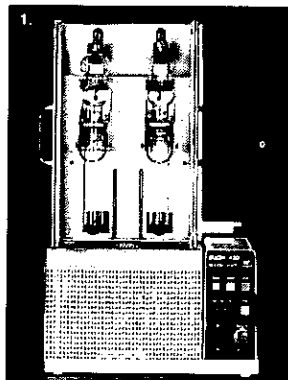
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COLLECTING AIRBORNE BACTERIOPHAGE USING A GELATIN MEMBRANE FILTER

Bacteriophage is a particular problem for cheese manufacturers due to its ability to contaminate cheese starter cultures, which if then used, render an unpalatable product. Bacteriophage can occur in a cheese manufacturing plant regardless of sanitation and cleaning regimes, and for this reason it is necessary for the dairy company to routinely check for its presence. Recent literature has quantitatively validated the Sartorius MD8 air sampler for virus and phage collection. Several of these units are in routine operation in Australian dairy companies, with a reference unit located at CSIRO's Dairy Research Division.

METHODS

To collect airborne microbes using an air sampler, a defined volume of air is suctioned through the gelatin membrane filter attached to the filter holder of the air sampler. The microorganisms are quantitatively retained on the surface of the filter, which can then be processed according to two different methods: direct placement of the gelatin filter on a solid culture medium (direct method) or dissolution of the gelatin filter (indirect method). Following the sampling procedure in the second method, the filter is completely dissolved by stirring using a magnetic stirrer and the microbes suspended in this solution can then be further examined depending on the particular test procedure (for example, preparation of a dilution series). To collect the microbes suspended in the solution, filtration is performed again, this time through a water insoluble membrane filter. The membrane filter on which the microbes are collected is placed on a suitable solid culture medium and incubated. Afterwards, the microbes are evaluated. The indirect method involving dissolution of the gelatin filter is particularly recommended when inhibitors, such as antibiotics or disinfectants have to be removed.

AIRBORNE PHAGES AND VIRUSES

Whereas the direct method for detection of airborne microbes has turned out to be the most convenient technique, the indirect method continued to be neglected. This has changed since more recent results obtained by collecting experimentally produced, static coliphages and influenza virus aerosols prove that soluble gelatin filters are also suitable for retaining airborne viruses and phages. For instance, after phages were collected on gelatin filters, the following retention rates were attained: 99.9% at a 50% relative humidity (inlet velocity 0.3m/s) for T1 coliphages and 99.94% at an 80% relative humidity (inlet velocity 0.3m/s) for T3 coliphages. This may seem surprising for a 3µm pore size. However, since the filter acts as a depth filter, not only are mechanical effects involved in particulate retention, but also adsorptive effects, electrostatic forces and Van der Waals forces within the depths of the fibre matrix play a significant role. This explains why the retention rates are so high, particularly for viruses and phages.

ROLE OF GELATIN

The results yielded by the two test sampling procedures prove

the existence of an important characteristic of the gelatin membrane filter in collecting virus aerosols. The gelatin simultaneously acts as a protective protein in preventing inactivation of viruses at the contact surfaces between glass/water and water/air which are formed during shaking or while air flows through liquids (impinger method of collection). Beyond demonstrating the suitability of the gelatin filter for collecting virus aerosols, the results also show that the gelatin filter can be superior to impaction collectors and to impingers in terms of collection efficiency.

OUTLOOK

The comparatively uncomplicated method of air filtration using a gelatin membrane filter is bound to gain importance in order to solve a number of scientific problems concerning the production, stability, spread and release of infectious virus aerosols (eg. in relation to legislation governing genetic engineering and high security laboratories dealing with genetic engineering techniques).

For further information contact: **Medic Corporation Limited**, Private Bag, Lower Hutt. Ph. (04) 569 3539, Fax (04) 569 7984. Or circle number 53 on the reader reply card.

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A LOOK AT A MODERN DAIRY LABORATORY

KIWI COOPERATIVE DAIRIES LTD

by Diane L. Topless
Senior Microbiologist, Kiwi Dairies

Situated in the rural heart of South Taranaki, Kiwi Dairies is a surprisingly large industrial company.

As the sole Taranaki dairy co-operative, Kiwi Dairies processes approximately 7.4 million litres of milk per day at peak season. This milk is collected by a fleet of 50 tankers which operate 24 hours a day to collect from 2,650 farms in the area.

Projected production estimates for the 1993/94 dairy season are:-

Cheese	45,000 tonnes
Milk Powders (Wholemilk, Skimmilk, Buttermilk)	100,000 tonnes
Whey Protein Concentrate	2,000 tonnes
Casein	3,000 tonnes
Butter/AMF	40,000 tonnes

These figures result in Kiwi Dairies being recognised as the largest dairy manufacturing site in the world producing 4% of New Zealand's total export earnings.

Just as the site production is extremely large so too is the laboratory which services the company's analytical requirements. The Kiwi laboratory meets four major company requirements, i.e.

- 1) milk quality and compositional data provided for supplier payment
- 2) process control testing of in-process samples
- 3) export grading of final product
- 4) provision of technical advice and problem solving for production areas.

Our laboratory, which is Telarc registered under the dairy laboratory programme, employs up to 60 technicians and is organised on a sectional team basis with a Section Leader (e.g. Milk Powder Microbiology) who is in charge of each group and reports to laboratory management.

The hallmark of Kiwi laboratory's operation is not so much test complexity but analysis throughput (e.g. at the production peak our laboratory will be testing 100 final product butter samples per day). Thus automation of test procedures with savings in analysis times, materials and labour becomes an attractive option.

Recent moves toward automation have included the purchase of a Malthus 2000 analyser and the Foss Heraeus nitrogen analyser.

Kiwi laboratory recruits staff largely from two educational groupings. Firstly, we employ school leavers (at 7th form level) whom we train through both on-the-job training and external courses such as NZCS (Food Science) and, secondly, we employ qualified personnel (graduates in relevant disciplines). The need for this group is rapidly increasing and we anticipate greater recruitment from this area in the future.

What of the future for large laboratories such as Kiwi Dairies? The laboratory will still play an integral role in the success of Kiwi Dairies for many years to come. However, I believe that the role of the laboratory will see radical alterations. We will become less involved in bulk routine testing of final product as the emphasis moves towards greater process consistency and control within production areas BUT we will also become much more involved in technical assistance, guidance and innovation - a challenge for the Kiwi laboratory staff of the future!

**Trying to improve process efficiency?
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CONTROL AT THE SPEED OF LIGHT

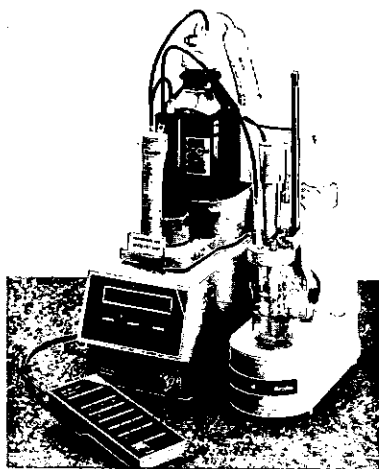
circle number 26 on the reader reply card

NEW PRODUCTS AND TECHNIQUES

THE NEW METROHM 727 TITRATION STAND

In pH measurements, direct potentiometry and titrations performed in analytical laboratories; both the stirring of samples and thorough cleaning of the measurement setup are of immense importance. The 727 Titration Stand from Metrohm offers a complete solution to the problem of stirring, rinsing and manual sample changing. Pressing the rinsing unit "showers" electrodes, burette tip and rod stirrer from above with the rinse nozzles integrated in the measuring head. In the centre of the beaker base is an outlet for any spilled solvents.

Depending on the model, the titration stand allows stirring to be performed either from above or from below or alternately from above and below. The speed range of the rod stirrer is between 500 and 2400 rpm. To change the sample, simply raise the measuring head. This automatically switches off the stirrer. As soon as the measuring head is in the measuring



position again, the stirrer restarts. Two electrode holders ensure the safe storage of electrodes.

Contact: **John Morris Scientific Ltd**, P.O. Box 6348, Wellesley Street, Auckland. Ph. (09) 444 5836, Fax (09) 444 0974.
Or circle number 29 on reader reply card.

NEW AUTO AND SEMI-AUTO DISTILLATION UNITS FROM BUCHI

The new BUCHI Auto Kjeldahl System B-339 now available from Watson Victor is a fully automatic unit for speedy and problem-free nitrogen determination, performing distillation, titration, calculation and print out of the results.

The time for a full determination is only 3-4 minutes and you can preselect different working methods.

The plastic housing is resistant to alkali and acid. The novel LCD user display is combined with familiar keyboard layout. Easy-to-use multitasking software allows you to work in different menus at the same time, and you can connect a

balance, printer and PC/computer via standard interfaces.

All relevant data for up to 200 samples remains stored should there be a power failure. For fast and reliable data output, a printer is integrated which automatically produces analysis data for every determination. This information accurately details all preselected parameters as well as the result and the calibration data of the pH electrode. The unique steam generator is maintenance-free if distilled or deionised water is used. It is self-adjusting and electronically monitored and therefore always at constantly high efficiency.

The recovery rate is more than 99.4%, the relative reproducibility is better than +/- 1% and the detection limit is 0.2mg nitrogen. Together with BUCHI's Digestion Unit B-435, Control Unit B-436 and Scrubber Unit B-412, the new BUCHI B-339 comprises a powerful Kjeldahl system.

The new BUCHI B-316 distillation unit is a semi-automatic unit for speedy and problem-free Kjeldahl distillation using steam. Its steam generator is also maintenance-free and cuts down the distillation time to 2 - 3 minutes.

The quantity of alkali necessary for the distillation can be optimally metered - you simply press a button. The desired distillation time is preselected with the timer. The hood of the apparatus is easy to remove, making all the operating elements readily accessible. The distillation residues can be removed by aspiration after each distillation.

The recovery rate is more than 99.4%, the relative reproducibility is better than +/- 1% and the detection limit is 0.5mg nitrogen. Together with the BUCHI Digestion Unit B-426 and the BUCHI Aspiration and Scrubber Unit B-412, the new BUCHI B-316 offers a user-friendly Kjeldahl system which will ensure efficient, fast, accurate and safe nitrogen determinations to be carried out in the laboratory.

Contact: **Watson Victor Limited**, P.O. Box 1180, Wellington. Ph. (04) 385 7699 Fax (04) 384 4651.
Or circle number 30 on reader reply card.

Advertise in Chemistry in
New Zealand
For Classified Advertising
Ph. (09) 486-4304

HP CHROMATOGRAPHY

Hewlett-Packard Company has announced that the new 1992 Chromatography Users Catalogue is now available. This 288 page catalogue describes more than 100 new products and features a new range of capillary and HPLC columns. Each section contains information in a comprehensive, at-a-glance format that includes the following:

- * an extensive range of capillary columns with choices such as the industry-standard, HP 608, HP 5 MS, HP 624, HP VOC,
- * SFC columns and supplies;
- * GC inlet kits;
- * a wide range of HPLC columns including Hypersil ODS, Spherisorb ODS-1, PTH, Anion, Asahipak;
- * electron multipliers; and
- * autosampler supplies, including new vials and caps.

The catalogue reinforces HP's position as a leading source for analytical columns and supplies for the lab. All HP/columns and supplies are developed using instrument standards for optimal chromatography results.

A copy of the catalogue can be obtained by contacting a local Medtec office.

For further information circle number 31 on the reader reply card.

HPLC SYSTEMS FOR VITAMINS, ANIONS, CATIONS....

WATERS offer a wide range of HPLC systems and chemistries for food and agricultural product analysis. Application areas include quality control, process/product evaluation, research and development and regulatory compliance. Specific examples include baby food, cereals, milk and milk products, fermentation broths, packaging, vitamin premixes, milk powders. Analytes include amino acids, anions and cations, carbohydrates, dyes, fatty acids, flavours, mycotoxins, natural colours, natural products, organic acids, peptides, pesticides, preservatives, protein and peptides, sweeteners, triglycerides, vitamins.

Dedicated or modular systems are available to allow a specific analysis or to permit the widest flexibility. A unit can be manual or automated, with UV/Vis, Diode Array, Fluorescence, Conductivity, Electrochemical, Refractive Index, or Mass detection depending on the analyte. Full application support and customer training/back-up is available from Alphatech's HPLC Specialists.

For more information or to request the brochure "Food and Agricultural Product Analysis."

Contact: Steve Lawson, Alphatech Systems.
Ph (09) 377 0392.

Or circle number 32 on reader reply card.

NEW CAPILLARY ELECTROPHORESIS SYSTEM FROM HP

Hewlett-Packard Company recently introduced the HP 3D Capillary Electrophoresis System, a fully automated system that incorporates a new high-sensitivity diode-array detector designed for on-capillary detection; and HP Extended Light

Path Capillaries, which increase sensitivity threefold over straight capillaries, without sacrificing resolution.

The HP 3D Capillary Electrophoresis System is targeted for pharmaceutical and bioscience research-and-development laboratories that emphasise analytical services and QA/QC.

The new system is automated from sample introduction to result reporting and random access is available to all 48 vials in the carousel for autosampling and fraction collection. Vials are sealed and temperature is controlled thermostatically to prevent sample evaporation and degradation.

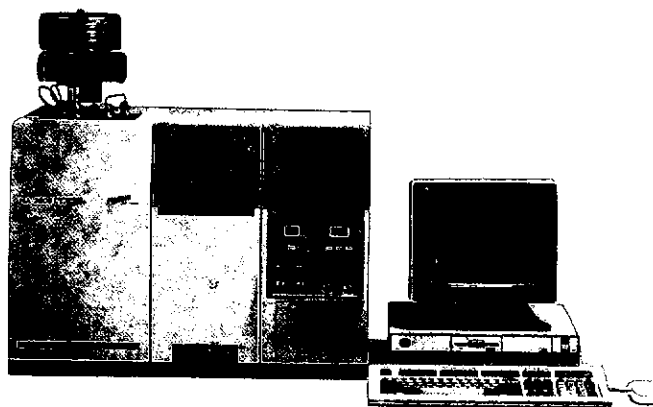
Full spectral data for compound identification and confirmation, and peak-purity assessment are available for each analysis. The peak-purity algorithm speeds up method development by determining the purity of non-Gaussian peaks, which frequently occur in capillary electrophoresis.

The system is controlled via an HPCE 3D HP ChemStation. A self-explanatory user interface guides operators step by step through the operating procedures and shows the status of the run in real-time. The software is based on industry-standard Microsoft(R) Windows.

Contact: Medtec Products Ltd, Wellington.
Ph. (04) 567 0011.

Or circle number 33 on reader reply card.

FORGET ACIDS, FUMES AND GLASSWARE! FISONS INSTRUMENTS NA 2000 NITROGEN AND PROTEIN ANALYSER THE ALTERNATIVE TO KJELDAHL



The new NA 2000 Nitrogen and Protein Analyser is an automatic system based on a simple combustion process, which has been specifically designed as an ideal alternative to the Kjeldahl method.

A rational design of the analytical layout is one of its most interesting characteristics, ensuring the maximum ease of use and reliability.

The sample preparation is reduced to a minimum, because the NA 2000 Nitrogen and Protein analyser can burn up to 0.5 g of sample, simply weighed in a container and loaded in the autosampler carousel.

When productivity is an important issue, the NA 2000 will analyse up to 125 samples in a completely unattended way, and with a total run time 3 - 5 minutes per sample.

All parts of the instrument, its chemicals and consumables have been optimised to reduce the cost per analysis, the downtime and the frequency of maintenance.

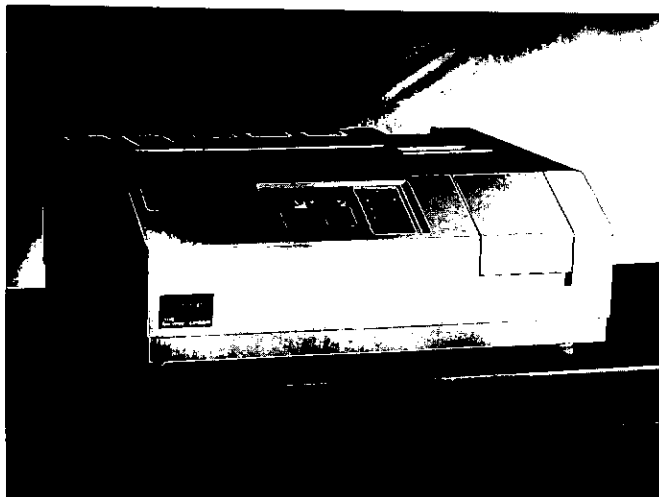
Contact: Steve Lawson at Alphatech Systems (09) 377 0392.
Or circle number 34 on reader reply card.

PERKIN-ELMER'S NEW LOW-COST UV/VIS SPECTROMETER

MAKES ROUTINE APPLICATIONS EASIER

The new Lambda 11 Ultraviolet/Visible Spectrometer from Perkin-Elmer is a low-cost scanning spectrometer that combines high quality and reliability with simplified operation. Designed primarily for routine quality control, research and educational applications, the new spectrometer speeds up analysis time with preprogrammed methods that users can execute with one keystroke.

The methods on the Lambda 11's keyboard can be configured according to five primary laboratory tasks. In the default configuration, these methods include: spectral scanning; absorbance versus time analysis; programming of up to eight wavelengths; quantitative analysis with a concentration factor;



and concentration measurement with calibration curves using up to eight standards.

The Lambda 11 is based upon the proven reliability of the Perkin-Elmer Lambda 2 Spectrometer's optical system. A variety of accessories are available for automated sample handling and specular reflectance measurements.

Contact: Perkin Elmer - New Zealand, P.O. Box 22-159
Auckland. Ph. (09) 276 2230, Fax (09) 276 5602.
Or circle number 35 on reader reply card.

LABORATORY SAMPLE PREPARATION SYSTEMS FROM ROCKLABS

Rocklab's systems are designed and built to suit each customer's needs. They are based on a modular concept in a simple flow-through sequence.

Rocklab's systems can handle samples up to 25kg and pulverize any proportion, including the whole sample if necessary, before splitting. Or they can handle a continuous stream of material or small samples.

Typical system features include: 10mm Entry Grizzly, Pneumatic Elevator, Sample Hopper, Vibrating Feeder, Rotary Splitter (30% retained split, 70% coarse reject), Continuous Ring Mill, Rotary Splitter (6% retained split, 94% fine reject), and Sample Bag.

Contact: Rocklabs Ltd, PO Box 18-142, Auckland 6. Phone (09) 570-4698, Fax (09) 570-9643.
Or circle number 36 on the reader reply card.

BIOCHROM'S NEW UV-VIS SPECTROPHOTOMETER WITH REVERSE OPTICS

The new Biochrom Model 4060 UV/VIS Spectrophotometer employs a monochromator between the sample and the photomultiplier tube. This design, long used in infra-red spectrophotometers, allows an open sample compartment for ease of use and accessibility, and gives rise to a 1nm bandwidth. The model 4060 is PC controlled via Windows environment software with kinetics, scanning, fraction analysis, time drive, etc included in the standard configuration.

Contact: Sci Tech, PO Box 12-190, Wellington.
Phone (04) 499-8868, Fax (04) 499-8869.
Or circle number 37 on the reader reply card.

MEMBRANE SEPARATION TECHNOLOGY : A 3-DAY COURSE

28-30 June 1993, Centre for Continuing Education
THE UNIVERSITY OF AUCKLAND

A world leader in the subject, Professor S. Sourirajan, will conduct this short course in Auckland. A pioneer in the study of Membrane Science and Technology, having developed the now world-renowned Loeb-Sourirajan membrane for desalination, Professor Sourirajan was associated with the National Research Council of Canada from 1961-1986 and was the Founding Director of the Industrial Membrane Research Institute of Canada. He is the author of numerous articles, patents, and standard text books on the subject.

On Day 1 of this short course, the fundamentals of membrane technology will be examined. Day 2 will deal with Applications and Advances in the Dairy and other Food Industries, while Day 3 will be dedicated to Water and Waster Water Treatment. Attendees may wish to enrol only on those days that are of particular interest to them. For more details and to be put on the mailing list for the enrolment brochures, please contact:

Barry Williams, Centre for Continuing Education,
University of Auckland (Fax (09) 373 7419,
Ph. (09) 373 7599 ext. 8903) or
John Chen, Chemicals & Materials Engineering, University
of Auckland (Fax (09) 373 7463,
Ph. (09) 373 7599 ext. 8137).

NEW HANDHELD DISSOLVED OXYGEN SYSTEM FROM YSI

The YSI 55 is a complete system including meter, probe and cable, for measuring dissolved oxygen.

The handheld meter features easy pushbutton calibration, built-in calibration chamber and simultaneous display of oxygen and temperature. The meter reads in mg/L or % oxygen and offers direct salinity compensation from 0 to 40 PPT. The large backlit display is easy to read and a low battery indicator tells the user when power is running low. The probe, with stainless steel weighted body, has a 12 foot or 25 foot permanently attached cable.



Contact: **John Morris Scientific Ltd**, P.O. Box 6348, Wellesley Street, Auckland. Ph (09) 444 5836, Fax (09) 444 0974.
Or circle number 38 on the reader reply card.

NEW GENERATION TOC ANALYSIS FROM SHIMADZU

This compact and light Total Organic Carbon analyser has many advanced features which make it environment and user friendly.

The performance-proven low temperature combustion-NDIR method reduces operating costs by prolonging the life of the combustion tube and catalyst while also reducing power consumption. High salt samples such as sea water and brines may be analysed easily without salt artifacts or combustion tube devitrification. Total organic carbon substances are oxidised rapidly and effectively, regardless of their composition.

The TOC-5000 uses an NDIR detector which combined with a large sample capacity combustion system ensure superior sensitivity with detection limits of less than 10ppb of TOC.

A large LCD provides high quality images minimising eye fatigue, it may also be tilted to afford the best viewing angle. The screen displays operating conditions, data, peaks, and other messages.

The sample injection volume may be changed over a wide range in microlitre increments. This combined with the data processing functions provides accurate, reproducible data. Sample injection is automatic: set the sample in place and press the START key; all the analysis procedures, from



sparging to data printout, are carried out in a completely automated sequence.

Contact: **Douglas Scientific**, Ph. (09) 837 5447, Freephone (outside Akld) 0800 735 725, Fax (09) 837 5446, P.O. Box 45-027, Auckland 8.

Or circle number 39 on the reader reply card.

NEW APPLICATIONS, ACCESSORIES ENHANCE APPLIED BIOSYSTEMS CAPILLARY ELECTROPHORESIS SYSTEM

New protocols, chemistries, accessories and a powerful, patented optics technology have enhanced the analytical capability and convenience of Applied Biosystems' Model 270A-HT Capillary Electrophoresis (CE) system. Recently introduced protocols for isoelectric focusing and fraction collection and a new chemistry kit for molecular weight determination of proteins have expanded the utility of the system for research and methods development. Now, a proprietary optical technology designed specifically for Applied Biosystems' CE systems provides an increase in sensitivity that is an order of magnitude greater than its own industry-leading standard.



The new technology provides the sensitivity demanded for such applications as drug purity analysis, protein and DNA analysis and trace analysis in a variety of industrial and environmental applications. Coupled with other sensitivity enhancing strategies such as stacking techniques, the proven UV detector and optical system can provide sensitivity that is several orders of magnitude higher.

In addition to new specialty applications kits, the 270A-HT is

compatible with a variety of computer systems for data handling. Applied Biosystems' Model 600 Data System is a Macintosh-based programme for data analysis. However, the 270A-HT offers the flexibility to accommodate virtually any computer system for data handling and control available in the future.

Contact: **Perkin Elmer - New Zealand**, P.O. Box 22-159 Auckland. Ph. 09-2762230, Fax 09-2765602.

Or circle number 40 on the reader reply card.

SEQUENTIAL FLEXIBILITY AND SIMULTANEOUS SPEED WITH NEW OPTIMA 3000 ICP-OES FROM PERKIN-ELMER

The new Optima 3000™ Inductively Coupled Plasma Optical Emission Spectrometer from Perkin-Elmer represents breakthrough technology with a new detector and patented optical system that enable users to measure the spectral background and each analyte line simultaneously. This allows users to measure 60 elements in less than one minute at multiple wavelengths, without sacrificing precision or sensitivity. In addition, the Optima 3000 — which occupies only one square meter of floor space — includes over 5000 emission lines, providing the flexibility to select alternate interference-free lines for superior results.

The Optima 3000's capabilities are based on a new detector, — designed specifically for plasma emission spectroscopy — a matching optical system, and a new means of power control for a free-running RF generator. The spectrometer consists of an Echelle based polychromator with a Segmented-array Charge-coupled Detector (SCD), a 40-MHz free-running RF generator with True Power Control (TPC) and temperature-controlled plasma pneumatics in a compact, free-standing, easily-serviceable package. The Optima 3000 provides two doors into the sample compartment for removal and replacement of the quick change torch module.



The entire instrument is controlled from a powerful 486-based computer that automates all instrument functions including plasma operation, autosampler control and data acquisition. The software stores relevant operating parameters including source conditions, analytical methods, and calibration information. During method development, the powerful automated optimise function easily selects the proper power, viewing height, and gas flows. Along with storing the analytical results, the software provides post-analysis data processing of stored spectra.

Contact: **Perkin Elmer - New Zealand**, P.O. Box 22-159, Auckland. Ph. (09) 276 2230, Fax (09) 276 5602.

Or circle number 41 on the reader reply card.

FIELD PORTABLE X-RAY FLUORESCENCE ANALYSER

With greater emphasis on environmental monitoring a need for systems to measure hazardous materials rapidly and inexpensively yet with uncompromised accuracy, is becoming more apparent. In addition most of the critical testing has to be done in the field rather than in laboratory conditions if the programme of environmental monitoring is to be timely and cost-effective.

Outokumpu Electronics' field portable X-Ray Fluorescence analyser HAZ-MET is designed specifically for this purpose. Using X-ray Fluorescence the instrument is capable of simultaneous, multielemental, non-destructive analysis over a dynamic concentration range with excellent precision.

Battery powered, lightweight, with its own on-board microprocessor and software, HAZ-MET is a tool capable of real time, field measurement of inorganic contaminants in the environment. It is able to provide hundreds of field measurements in a short time with drastically reduced cost.

HAZ-MET detects the majority of priority pollutant elements in solids, slurries, liquids and powders.



Other systems in the Outokumpu range include ARC-MET mobile optical emission analysers, and X-MET analysers.

Contact: **Douglas Scientific**. Ph. (09) 837 5447, Freephone (outside Akld) 0800 735 725, Fax (09) 837 5446, P.O. Box 45-027, Auckland 8.

Or circle number 42 on the reader reply card.

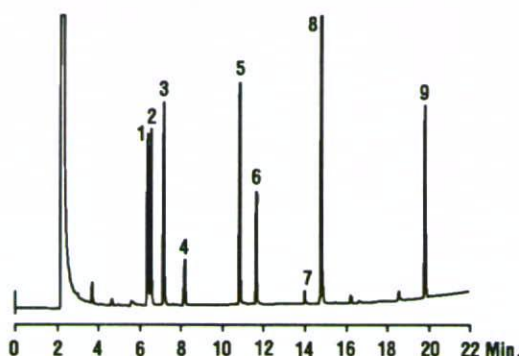
SAVANT'S NEW AUTOMATED ENVIRONMENTAL SPEEDVAC SYSTEMS

Savant has recently introduced three new SpeedVac concentrator systems offering the very latest in state of the art technology for sample concentration and featuring environmentally responsible CFC free refrigeration systems.

All models incorporate Savant's patented VapourNet technology comprising a CFC free refrigerated vapour trap and

"Everything for Chromatography"

CHROMATOGRAM
1021



1. 1,3-Dichlorobenzene
2. 1,4-Dichlorobenzene
3. 1,2-Dichlorobenzene
4. Hexachloroethane
5. 1,2,4-Trichlorobenzene
6. Hexachlorobutadiene
7. Hexachlorocyclopentadiene
8. 2-Chloronaphthalene
9. Hexachlorobenzene

Column: Econo-Cap™ SE-54™, (Cat. No. 19646)
30m x 0.32mm ID x 0.25µ
Temp: 90°C (6min) to 220°C at 10°C/min
Flowrate: Helium, 1.06mL/min
Detector: FID/300°C **Injector:** 250°C

Alltech

Alltech New Zealand

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GBC Scientific NZ

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Auckland 1

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Facsimile 0-9-360 0683

CHROMATOGRAPHY



Automated Gradient HPLC System

**H.P.L.C.
GC**

circle number 8 on the reader reply card

an oil-free vacuum pump. The AES1000 and AES2000 models offer the highest level of solvent recovery and the flexibility to deal with all types of solvents. These models also have dual timers to independently control drying time and drying rate. The ISS100 model is designed especially for laboratories that generally process aqueous or aqueous/organic solvent mixtures.

Savant SpeedVac systems are designed to occupy a minimum of valuable bench space, and are built to the highest quality standards (Savant is a registered ISO 9001 company). Each system has a wide range of rotors and accessories available so that a user can tailor a system to meet both present and future needs.



Contact : Labsupply Pierce (NZ) Limited, P O Box 34-234 Birkenhead, Auckland 10. Ph. (09) 443-5867, Fax (09) 444-7314

Or circle number 43 on the reader reply card.

HP INTRODUCES A FULLY INTEGRATED SAMPLE - PREPARATION SYSTEM FOR ITS GC AND MASS SPECTROMETER

Hewlett Packard Company's new HP 7686 PrepStation system automates the sample preparation steps that occur prior to injection into an HP analytical instrument for increased productivity, greater ease of use and lower cost than manual sample-preparation methods.

The HP 7686 PrepStation integrates sample preparation with an HP 5890 Series II GC or an HPGC bench top MS. Components of the HP 7686 PrepStation system are mounted on the periphery of the HP 7673 automatic sample tray. Now, instead of simply transporting samples to the GC injector, the sampler arm manipulates vials through many stages of sample preparation.

The HP 7686 PrepStation system delivers each prepared sample for analysis precisely when the analyser is ready to process it. With this just-in-time sample delivery, one sample is being analysed while the next sample is being prepared. Every sample receives identical treatment, which reduces variability and improves the quality of results.

The HP 7686 PrepStation system includes a choice of two sample-preparation modules and a combination bar-code reader/mixer, software and accessories. These are: basic sample-preparation module - performs automated dilutions, standard

addition or preparation, derivatization, evaporation and solvent exchange; solid-phase extraction (SPE) module - provides all the functions of the basic module plus solid-phase extraction and filtering capabilities.

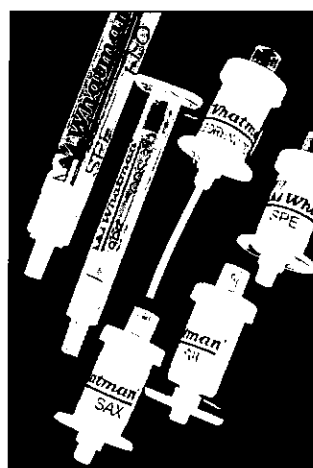
Running under Microsoft (R) Windows and together with the HP ChemStation (DOS series), the HP 7686 PrepStation software links sample preparation with analysis and controls the entire analytical system. Sample preparation methods are created by selecting the desired functions from the pull-down menu and entering the parameters. The HP 7686 PrepStation provides users with a complete documentation of the analytical process. The final report includes data from both sample preparation and analysis, and details the entire procedure, thereby enhancing the laboratory's sample-tracking capability.

Contact: Peter Hermans, Medtec Products Ltd, Auckland. Ph. (09) 480 5875.

Or circle number 44 on the reader reply card.

NEW WHATMAN SOLID PHASE EXTRACTION SYSTEM FOR SAMPLE PREPARATION

Designed for concentration or isolation of select species from complex sample matrices, the Whatman Solid Phase Extraction Devices have an integral frit/polypropylene filter assembly.



This frit/filter assembly will withstand almost all organic solvents and will filter the effluent with no extractables providing the cleanest samples for GC or HPLC analysis. The solid phase extraction columns are available in several column capacities including 1ml, 3ml, 6ml and 12ml reservoir syringe-barrel columns and a cartridge format for use with a syringe. A wide range of silica based packing chemistries are available including ODS, ODS-1, ODS-2, ODS-3, ODS-4, ODS-5, ODS-6, C₈, Si, Florisil[®], SAX and SCX.

Contact: Labsupply Pierce (NZ) Limited, P.O. Box 34-234, Birkenhead, Auckland 10. Ph. (09) 443 5867 Fax (09) 444 7314.

Or circle number 45 on the reader reply card.

NEW EDUCATIONAL PACKAGE PROVIDES COMPREHENSIVE INSTRUCTION IN INFRARED SPECTROSCOPY

Perkin-Elmer's new 1600 Series Fourier Transform Infrared (FT-IR) Educational Package provides comprehensive instruction in infrared spectroscopy at the college level— from

Conferences and Seminars

NZIC CONFERENCE

7-10 December 1993.

Venue: University of Auckland.

In conjunction with the Medicinal and Agriculture Division of the Royal Australian Chemical Institute (RACI).

Plenary Lectures Symposia, Poster Sessions, Student Paper Competition, Social Events, Instrument and Equipment Trades Display.

See the next issue (July 1993) of Chemistry in New Zealand for a more detailed guide to the conference.

For further information contact:

Dr. Allan Easteal, Conference Secretary,
Chemistry Department, University of Auckland,
Private Bag 92019 Auckland.
Ph. 64-9-373 7599 extensions 8963 or 8343
Facsimile 64-9-373 7422.

16-18 June, 1993, 1st Arnold D. Beckman IFCC European Conference on Environmental Toxicology - Biomarkers of Chemical Exposure.

Venue: Munich, Germany.

For further information contact:

Mr. H.J. Schverings, KIM, Mauerkircherstrasse 4
D-800 Muechen 80, Germany.
Ph. 49-89-9-828005 • Fax 49-89-9-8 1356

5-8 July, 1993, 37th Annual Conference of the Australian Society for Biochemistry and Molecular Biology.

Venue: Adelaide Convention Centre, Adelaide, South Australia.

For further information:

Dr. Greg Baritt, Dept of Medical Biochemistry,
School of Medicine, Flinders University,
GPO Box 2100, Adelaide,
South Australia 5001.
Ph. 61-8-2044260 • Fax 61-8-3740139

31 July, 1993, N.Z. Federation of University Women, Auckland Branch. Seminar on "Demystifying Economics"

Venue: Conference Centre, University of Auckland, 2.00pm to 5.00pm 22 Symonds Street, Auckland.

For details:

Phone Dr. Dormer 09-5246404

9-13 August, 1993, Asianalysis II. Asian Conference on Analytical Chemistry.

Venue: Changchun, China.

For further information contact:

Professor Erkang Wang,
Changchun Institute of Applied Chemistry,
Chinese Academy of Sciences, P.O. Box 1022, Changchun,
Jilin 130022 China.

26 September-1 October, 1993, 12th Australian Symposium on Analytical Chemistry (12AC) incorporating the 3rd Environmental Chemistry Conference (3EL).

Venue: Burswood Convention Centre, Perth, Western Australia.

For further information contact:

Conference Secretariat, 12AC/3EC, UWA Extension,
Conference and Seminar Management,
The University of Western Australia, Nedlands,
Western Australia 6009.

Ph. 61-9-3803181 Fax 61-9-3801088.

20-22 October, 1993, 5th NZ Coal Conference.

Venue: Park Royal Hotel, Wellington, New Zealand.

For further information contact:

The Conference Secretary, 5th NZ Coal Conference,
Coal Research Association NZ Inc,
P.O. Box 31-244, Lower Hutt, New Zealand.

6-10 December, 1993, Australian Conference on Optics, Lasers and Spectroscopy.

Venue: University of Melbourne, Melbourne, Australia.

For further information contact:

Dr. R. J. McLean, ACOLS '93 Conference Secretary,
CSIRO Materials Science and Technology,
Locked Bag 33, CLAYTON,
Victoria 3168, Australia.
Ph. 64-3-5422875 Fax 64-3-5441128.

13-17 December, 1993, 3rd Pacific Polymer Conference, Gold Coast, Australia.

For further information contact:

PPC-3 Secretariat, Department of Chemistry,
University of Queensland, Queensland 4072, Australia.
Ph. 61-7-3653511 Fax 61-7-3653628.

13-18 February, 1994, 8th International Conference on Surface and Colloid Science.

Venue: Adelaide Convention Centre, Adelaide, South Australia.

For further information contact:

The Secretariat, Techsearch Incorporated,
GPO Box 2471, Adelaide,
South Australia 5001.
Ph. 61-8-2671755 Fax 61-8-2674031.

24-29 July, 1994, 30th International Conference on Co-ordination Chemistry.

Venue: Kyoto International Conference Hall, Kyoto, Japan.

For further information contact:

Professor Koji Taraka, Secretary of XXX ICC, Coordination Chemistry Laboratories, Institute of Molecular Science, Myodaiji, Okazaki, 444 Japan.
Ph. 81-564-55-7252 Fax 81-564-54-2254.

17-22 December, 1995, Pacific Chem '95.

Venue: Honolulu, Hawaii, U.S.A.

For further information contact:

Pacific Chem '95, American Chemical Society,
Room 420, 1155 16th Street N.W.,
Washington DC, 20036 U.S.A.
Ph. 1-202-8724396 Fax 1-202-8726128.

NZIC NEWS

AUCKLAND BRANCH

Michael Taylor took over from Jim Metson as the Chair of Auckland Branch at the start of 1993.

Michael who hails from Yorkshire read Chemistry at Oxford and held a Postdoctoral Fellowship in Ottawa before entering the research staff of ICI in the Paints and Surface Coatings Division in 1962. He came to Auckland in 1966, joining the Physical Chemistry Section of the University of Auckland-Chemistry Department as a specialist in structural methods. Alongside teaching and research in Raman spectroscopy he soon became involved in NZIC affairs as a member of the Branch Committee 1967-69, an active participant in conferences (organising the initial Student Paper Competition) and a supporter of the growth of specialist groups both within the Institute and linked to RACI developments.

His career attaining Associate-Professor rank in 1982, though never far from the teaching scene, has included sabbatical studies in Canada and UK and periods of concentrated writing as author of several sections of Comprehensive Coordination Chemistry, a monograph on metal-to-metal bonded compounds and, with Penny Brothers, the chapter on inorganic derivatives for a new book on the chemistry of aluminium, gallium, indium and thallium. These, besides research papers in main group chemistry, structures and spectra, particularly the applications of the multinuclear NMR technique, since this became part of the Auckland range. With Steve de Mora and John Hay, he recently compiled and edited, "Science and the New Zealand Environment" for students in science and social studies, one of the first books to bring New Zealand environmental science to the wider community.

The Chairmanship is Michael's third time on the local committee, having also served a turn in 1982-3, and fits alongside his current commitments to lecturing at Stage II, III and Honours levels, supervision of Masters and Ph D students, and the numerous miscellaneous tasks of a large university department. His recreational interests include bird-watching serious enough to be classified as ornithology, jogging too slow to be called running, and nature conservation activities which fall just short of green politics.

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The Inaugural P B D de la Mare Lecture was held at the University Conference Centre on 5 April. Shortly after Professor de la Mare's death in 1990, an appeal was launched by his colleagues to create a fund which would commemorate

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Helen Palmer

WAIKATO BRANCH

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Professor Tapio Hase of the University of Helsinki addressed the branch in March on "Chemistry in Finland". This was an interesting talk that covered both industrial and university aspects of chemistry in that country. Professor Hase and his colleague Dr. Kristina Wahala were on leave at the Chemistry Department of the University of Waikato from November 1992 to March 1993. In March also, a successful recruitment drive was held in the form of a barbeque for prospective members at the Common Room Club of the University. The final activity in a busy month was a seminar by Professor Reinhart Keese of the University of Bern entitled "The Importance of Fenestranes".

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An event which is currently underway is the branch schools' analytical chemistry competition. This is being run by Dr. Nick Kim and involves analysis of vitamin C in vitamin tablets.

Michelle Prinsep

Waikato Branch Executive (1993)

President: Rick Ede • Treasurer: Bill Henderson
Secretary: Ron Newth • Branch Editor: Michele Prinsep

MANAWATU BRANCH

Welcome to new members Tania Ngapo and Rajan Sharma, both from the Food Technology Department, Massey.

Peter Gill has just joined Massey University as a lecturer in Physical Chemistry. He joins the Chemistry and Biochemistry Department (after a 38 hour flight!) from Carnegie Mellon University, Pittsburgh, where he was involved in both applied and theoretical quantum chemistry. He plans to continue in this area at Massey.

Michael Nairn our long serving student representative leaves next month to continue his studies at Auckland University.

On April 21 the branch held a successful students meeting at which we gained about 40 new student members. The meeting started with a social hour and chemical trivia quiz; among the questions was one requiring intimate knowledge of Gill Norris' body composition. Gill declined to reveal the correct answer at the end of the quiz.

After dinner we adjourned upstairs where Gill presented the Biochemistry Prize to Treena Blythe and the Chemistry Prize to Jeremy Dombroski and Andrew Sutherland-Smith. Prizes were donated by Hort+Research CRI.

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Grant Boston

NEW LITERATURE

- (i) Michael Ash, Irene Ash:
Chemical Tradename Dictionary.
A key, comprehensive reference for identifying product lines in the international chemical marketplace.
Published by:
VCH Verlagsgesellschaft
P.O. Box 101161, D-6940 Weinheim, Germany.
Further details available from The Editor,
Chemistry in New Zealand.
- (ii) B. Diebrich, P. Viout, J-M Lehn:
Macrocyclic Chemistry.
A lucid introduction offering extensive coverage of the vast panorama of macrocyclic and macropolycyclic chemistry.

Published by:

VCH Verlagsgesellschaft

P.O. Box 101161, D-6940 Weinheim, Germany.
Further details available from The Editor,
Chemistry in New Zealand.

- (iii) K. Pflieger, H.H. Mawer, A. Weber:
Mass Spectral and GC Data, Parts 1,2,3 - Second Edition.
This second edition compiles mass spectra and chromatographic data on 4370 toxic drugs, poisons, pesticides and other pollutants and their metabolites.
Published by:
VCH Verlagsgesellschaft
P.O. Box 101161, D-6940 Weinheim, Germany.
Further details available from The Editor,
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- (iv) Professor F.P. La Martia:
Recycling of Plastic Materials.
This new book offers essential information for all chemists who are concerned with the proper use of technology and process economy.
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Ontario M1E1C6, Canada.
Ph. 416-2652603 Fax 416-2651399
More details available from The Editor,
Chemistry in New Zealand.
- (v) Professor D. Acierno, University of Salerno
Professor F.P. La Martia, University of Palermo:
Liquid Crystalline Polymers.
Liquid crystalline polymers are important in so many disciplines of polymer chemistry and technology that this book should be consulted by scientists, university researchers, applications engineers and plant engineers who are involved in the modern applications of polymers.
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Ontario M1E1C6, Canada.
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More details available from The Editor, Chemistry in New Zealand.
- (vi) Topo Metrix Corporation: **AFM Imaging Modes.**
A new 16 page technical report offering a definitive discussion of the many operating modes for imaging with the atomic force microscope (AFM).
Published by:
Topo Metrix Corporation
1505 Wyatt Drive, Santa Clara
California 95954, U.S.A.
Ph. 1-408-9829750 Fax 1-408-9829751
For further information contact The Editor,
Chemistry in New Zealand.

BOOK REVIEW

**CHEMICAL INFORMATION MANAGEMENT BY
WENDY A WARR AND CLAUS SUHR,**
published by VCH PUBLISHERS INC. (1992) \$47.00

This book of twenty three chapters and 261 pages (including a twenty four page index) contains a wealth of information about the management of chemical information.

The authors have considerable experience in information management gained in chemical industry. Primary scientific literature and the patent literature are accorded approximately equal importance. With the number of patents, reports and articles reportedly doubling every fifteen years and with approximately 12 million such items already published the management of chemical information is and will continue to be an important requirement for all practising chemists.

This book is based on, but expanded from, an article in Ullmanns encyclopaedia of Industrial Chemistry, Volume B1. The coverage is thus encyclopaedic and is reasonably comprehensive. It includes discussions on abstracting and indexing services, tertiary literature (encyclopaedias and handbooks), gray literature (reports, official publications, theses) and business information. On-line searching of databases, the nature of databases, chemical structure handling on both mainframe and microcomputers and reaction indexing are all covered. In the patent area, the nature of patents, their storage and the abstracting and indexing services covering the patent literature are all covered in some detail. Trends in the development of these systems are described and discussed.

The authors do not attempt to provide details on how to access or use the systems and tools that they describe. A typical example is the printed form of Current Contents which is described in one sentence and the electronic form of this extremely useful (to Academics) tool is mentioned later in another sentence. The software available for the construction of personal databases are similarly accorded only two sentences with a number of rival products mentioned. There is no attempt to highlight the strengths or weaknesses of these products. This is not necessarily a disadvantage, the knowledge that the software or database is available and its name, will be sufficient for many purposes and with that the relevant information may be obtained from other sources.

The book is surprisingly readable, although not compulsive reading. The audience is clearly the professional chemist or librarian who has some experience in the use of chemical databases. Students with little or no such experience may find the book Information Sources in Chemistry (4th Ed) edited by R T Bottle and J F B Rowland, published by Bowker Saur, London (1993) more useful. Practising chemists and those with a particular interest in the patent literature will find Chemical Information Management much more useful. As is expected from this publisher the book is extremely well produced. There is an extensive list of references and the book is very well indexed. The price however will mean that potential purchasers may be restricted to wealthy individuals or libraries.

Dr D C WEATHERBURN

Chemistry Dept, Victoria University.

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INSTITUTE OF
TECHNOLOGY**

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O Tamaki Makau Rau*

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Conferences and Seminars

NZIC CONFERENCE

7-10 December 1993.

Venue: University of Auckland.

In conjunction with the Medicinal and Agriculture Division of the Royal Australian Chemical Institute (RACI).

Plenary Lectures Symposia, Poster Sessions, Student Paper Competition, Social Events, Instrument and Equipment Trades Display.

See the next issue (July 1993) of Chemistry in New Zealand for a more detailed guide to the conference.

For further information contact:

Dr. Allan Easteal, Conference Secretary,
Chemistry Department, University of Auckland,
Private Bag 92019 Auckland.
Ph. 64-9-373 7599 extensions 8963 or 8343
Facsimile 64-9-373 7422.

16-18 June, 1993. 1st Arnold D. Beckman IFCC European Conference on Environmental Toxicology - Biomarkers of Chemical Exposure.

Venue: Munich, Germany.

For further information contact:

Mr. H.J. Schverings, KIM, Mauerkircherstrasse 4
D-800 Muechen 80, Germany.
Ph. 49-89-9-828005 • Fax 49-89-9-8 1356

5-8 July, 1993. 37th Annual Conference of the Australian Society for Biochemistry and Molecular Biology.

Venue: Adelaide Convention Centre, Adelaide, South Australia.

For further information:

Dr. Greg Baritt, Dept of Medical Biochemistry,
School of Medicine, Flinders University,
GPO Box 2100, Adelaide,
South Australia 5001.
Ph. 61-8-2044260 • Fax 61-8-3740139

31 July, 1993. N.Z. Federation of University Women, Auckland Branch. Seminar on "Demystifying Economics"

Venue: Conference Centre, University of Auckland, 2.00pm to 5.00pm 22 Symonds Street, Auckland.

For details:

Phone Dr. Dormer 09-5246404

9-13 August, 1993. Asianalysis II. Asian Conference on Analytical Chemistry.

Venue: Changchun, China.

For further information contact:

Professor Erkang Wang,
Changchun Institute of Applied Chemistry,
Chinese Academy of Sciences, P.O. Box 1022, Changchun,
Jilin 130022 China.

26 September-1 October, 1993. 12th Australian Symposium on Analytical Chemistry (12AC) incorporating the 3rd Environmental Chemistry Conference (3EL).

Venue: Burswood Convention Centre, Perth, Western Australia.

For further information contact:

Conference Secretariat, 12AC/3EC, UWA Extension,
Conference and Seminar Management,
The University of Western Australia, Nedlands,
Western Australia 6009.

Ph. 61-9-3803181 Fax 61-9-3801088.

20-22 October, 1993. 5th NZ Coal Conference.

Venue: Park Royal Hotel, Wellington, New Zealand.

For further information contact:

The Conference Secretary, 5th NZ Coal Conference,
Coal Research Association NZ Inc,
P.O. Box 31-244, Lower Hutt, New Zealand.

6-10 December, 1993. Australian Conference on Optics, Lasers and Spectroscopy.

Venue: University of Melbourne, Melbourne, Australia.

For further information contact:

Dr. R. J. McLean, ACOLS '93 Conference Secretary,
CSIRO Materials Science and Technology,
Locked Bag 33, CLAYTON,
Victoria 3168, Australia.
Ph. 64-3-5422875 Fax 64-3-5441128.

13-17 December, 1993. 3rd Pacific Polymer Conference, Gold Coast, Australia.

For further information contact:

PPC-3 Secretariat, Department of Chemistry,
University of Queensland, Queensland 4072, Australia.
Ph. 61-7-3653511 Fax 61-7-3653628.

13-18 February, 1994. 8th International Conference on Surface and Colloid Science.

Venue: Adelaide Convention Centre, Adelaide, South Australia.

For further information contact:

The Secretariat, Techsearch Incorporated,
GPO Box 2471, Adelaide,
South Australia 5001.
Ph. 61-8-2671755 Fax 61-8-2674031.

24-29 July, 1994. 30th International Conference on Co-ordination Chemistry.

Venue: Kyoto International Conference Hall, Kyoto, Japan.

For further information contact:

Professor Koji Taraka, Secretary of XXX ICC, Coordination Chemistry Laboratories,
Institute of Molecular Science,
Myodaiji, Okazaki, 444 Japan.
Ph. 81-564-55-7252 Fax 81-564-54-2254.

17-22 December, 1995. Pacific Chem '95.

Venue: Honolulu, Hawaii, U.S.A.

For further information contact:

Pacific Chem '95, American Chemical Society,
Room 420, 1155 16th Street N.W.,
Washington DC, 20036 U.S.A.
Ph. 1-202-8724396 Fax 1-202-8726128.

NZIC NEWS

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Ontario M1E1C6, Canada.
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- (v) Professor D. Acierno, University of Salerno
Professor F.P. La Martia, University of Palermo:
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- (vi) Topo Metrix Corporation: **AFM Imaging Modes.**
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BOOK REVIEW

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Chemistry Dept, Victoria University.

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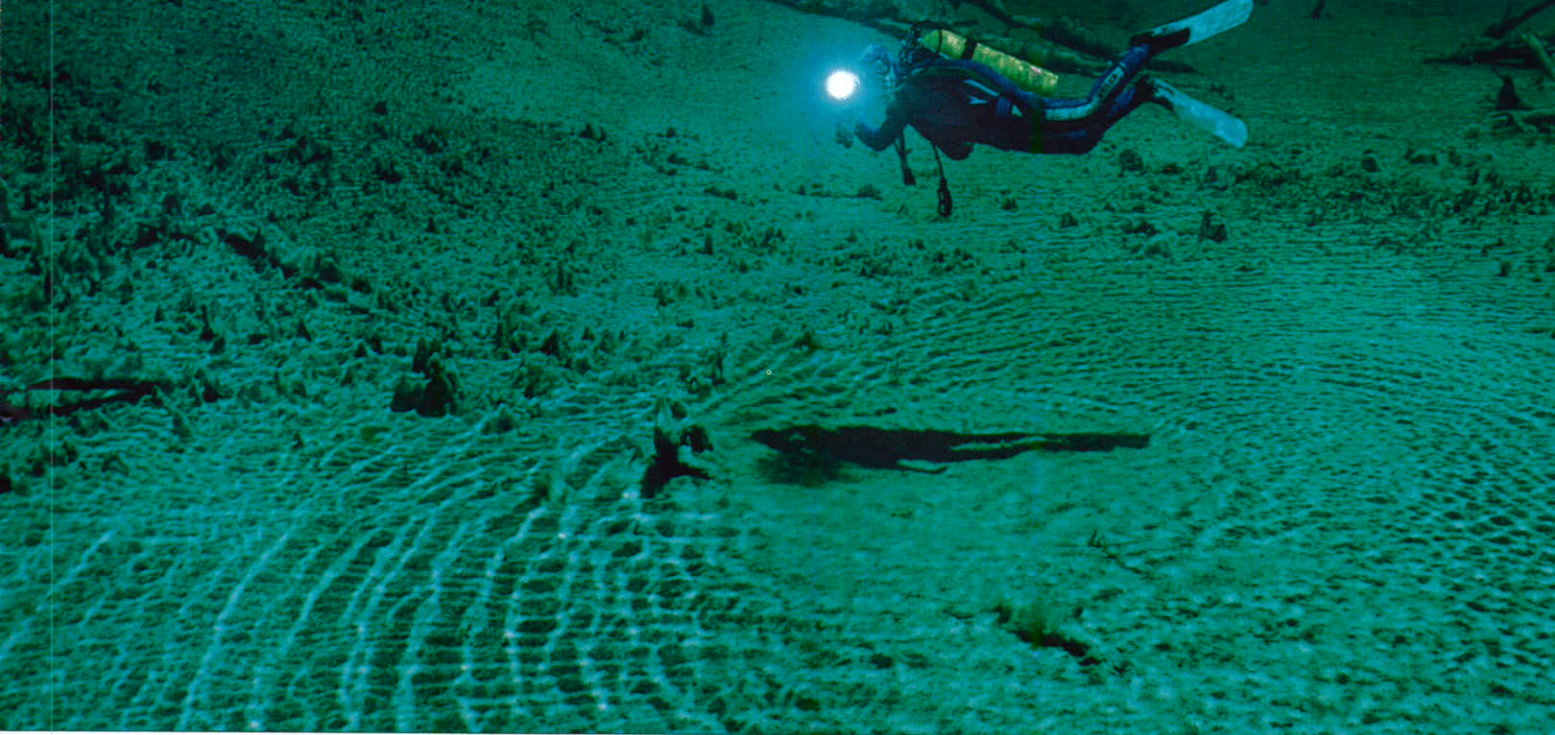
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