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Chemical Safety

International Reference Manual

Edited by
Mervyn Richardson



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Mervyn Richardson
Birch Assessment Services
for Information on Chemicals
6 Birch Drive
Maple Cross
Rickmansworth
Herts WD3 2UL UK

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WINDSOR CASTLE

All life and all the earth's inorganic components are locked into a series of chemical reactions. Into this immensely complicated inter-dependent system, humanity has added its own share of problems by devising and using an ever-growing range of chemicals for an ever-growing variety of purposes.

It is now becoming only too obvious that, although these chemicals may have served their purpose admirably, many of them have also had quite unexpected and unwanted side-effects. Furthermore, it has become apparent that there are also any number of human activities, that were never suspected of having any long-term chemical consequences. The release, over many years, of toxic substances and inadvertent pollutants have together created serious problems for the future health of our planet. This chain of disquieting events poses an urgent challenge to the chemical industry and research workers throughout the world.

I warmly welcome the publication of this book for demonstrating the innumerable ways in which chemicals can cause damage, and for showing how these damaging effects can be prevented or controlled.

Preface

Mervyn Richardson

The subject of chemical safety is one which affects us all. We are now totally dependent on chemicals: agrochemicals, pharmaceuticals, colorants for aesthetic purposes, etc; the list is almost endless.

What is now essential is to derive the knowledge to decide the safety of these substances and to answer the question — *how safe is safe enough?* The costs entailed in producing a risk-free society would be so great that few benefits would remain; and, the concept of zero risk means that one has a desire to live for ever.

This book leads the reader from the basic concepts in information retrieval, through hazard and risk assessment and risk management, to the all-important topic of chemical safety and legal aspects.

For us to continue to inhabit the Earth, the only planet currently we are able to utilize, or rather ravage, we have to appreciate more fully the safety of chemicals which are vital to our wellbeing, and that of the animals, plants, bacteria, etc. on which we all depend, and which in turn depend on the air, land and water environments. Having seen at first hand in Croatia how warfare is affecting the aggressed, the aggressor and the innocent, I have come to realise that it is vital that politicians, diplomats, and not least the media, inform the global population of the consequences to all of this unwarranted and unnecessary aggression. However, every disadvantage leads to an advantage — the former highly inefficient and polluting chemical industries can now be replaced by those involving high-efficiency, clean, low-waste techniques.

Following the United Nations conference on Environment and Development held in Rio de Janeiro, June 1992, many countries have begun to develop objectives for environmental sustainability.

As chemicals have become the keystone of modern society; chemicals and chemists have to lead the way to a sustainable future. The earth has finite resources but many natural resources are renewable and the potential to utilise these has to be exploited. Previously, an adequate level of sustainability has been found only after decreased production. Today, it is vital that we confront the challenge and meet the goals without any compromise of the ability of future generations to meet their needs.

In the earlier publication *Reproductive Toxicology*, the effects of chemicals on the environment causing reproductive defects, congenital malformations, especially in Central and Eastern Europe, were described by many authors. In the past year further occurrences of mortality exceeding birth rate have been noted, especially in the Commonwealth of Independent States.

In order to sustain, and more objectively, to improve upon the ability of human, natural and mixed systems to withstand and adapt to endogenous or exogenous changes, ideally indefinitely, much greater chemical safety assessment is essential.

Even more so in times of recession, chemists and indeed other industrialists have to be aware that promotion of a good environmental image and sustainability is a requirement for their bankers, insurers, suppliers, shareholders, neighbours, and customers; coupled with pragmatic and demonstrable procedures for the assessment and management of chemical safety.

Chemical safety can never be perfect, and it is vital to assess *how safe is safe enough?*. We, the present generation, must be able to pass on to the next generation a world in a fit state and not one spoilt by unwarranted chemical contamination. Only by this means will it be possible to maintain public health and social and economic welfare at a high level. The road to sustainability is a long, difficult and a tortuous one, but in a world of over 11 million chemicals the first steps must be taken now. *Chemical Safety* outlines the fundamental steps that are necessary. The contribution from its 65 authors drawn from a wealth of experience and eminence in 20 countries — from many ethnic, social and professional backgrounds illustrate both problems and successes, lead the way forward to enable future generations to exist among the chemicals on which we depend. Data included in this volume includes information from Central and Eastern Europe either not previously published or quoted in 'grey' literature in those countries and languages. The manual refers to environments and related aspects in 85 countries.

Our future can be summed up in the words of an Inuit from the tribes of Northern Canada: *I want to cause constructive damage to the status quo.*

As is common with multi-author works, there is some overlap between chapters, but these have been reduced to a minimum by editing, except where it was considered that overlap would enhance the subject matter.

The editor is indebted to the publisher for support, in particular to Dr. Don Emerson, and is greatly appreciative to Pauline Sim of Gascoigne Secretarial Services of High Wycombe, who both retyped the whole book and generally attended to all administrative matters. I also express my most sincere thanks to my wife, Beryl, for general support and who so patiently tolerated my working on this book, the mountains of paper and telephone calls, and for her assistance in the final proofreading and comments to this Preface and to the Epilogue.

Mervyn Richardson

Birch Assessment Services for Information on Chemicals (BASIC)

6 Birch Drive, Maple Cross, Rickmansworth, Hertfordshire WD3 2UL, England.

'The environmental threats facing the world are so great and so universal that no country, or group of countries, can hope to tackle them alone. They compel us to act together as a world community. They require us to forge a global partnership.'

Mostaka K. Tolba, Executive Director, United Nations Environment Programme,
October 1992.

List of Contributors

Marija Alačević, Faculty of Food Technology and Biotechnology, Laboratory of Biology and Microbial Genetics, University of Zagreb, Kršnjavoga 25, 41000 Zagreb, Croatia.

Margarita Barkiene, Centre for Environmental Medicine, Lithuanian Ministry of Health, Didžioji st 22, 2104 Vilnius, Lithuania.

Maja Blanuša, Institute for Medical Research and Occupational Health, University of Zagreb, Ksaverska, C.2, POB 291, 41001 Zagreb, Croatia.

Anthony Bulich, Microbics Corporation, 2232 Rutherford Road, Carlsbad, CA 92008, United States of America.

Marlissa A. Campbell, 6 Lovel Road, Chalfont St Peter, Buckinghamshire SL9 9NN, England.

Anne Cowie, Vital Information Ltd, 8 Leighton Road, Linslade, Leighton Buzzard, LU7 7LF, England

Andrew E. Czeizel, Department of Human Genetics & Teratology, National Institute of Hygiene, WHO Collaborating Centre, Gyáti Utca 2-6, H-1097 Budapest, Hungary.

Judith Deschamps, Department of the Environment, Room P3/008D, 2 Marsham Street, London SW1P 3EB

J-M Devos, European Chemical Industrial Council (CEFIC), Avenue E. van Nieuwenhuyse 4, Bte 1, 1160 Brussels, Belgium.

Morrell N. Draper, EDINTOX, Heriot-Watt University, Riccarton, Edinburgh EH14 4AS, Scotland.

Vlasta Drevenkar, Institute for Medical Research and Occupational Health, University of Zagreb, Ksaverska cesta 2, POB 291, 41001 Zagreb, Croatia.

John H. Duffus, EDINTOX, Heriot-Watt University, Riccarton, Edinburgh EH14 4AS, Scotland.

Marja Ekroos, European Chemical Industrial Council (CEFIC), Avenue E. van Nieuwenhuyse 4, Bte 1, 1160 Brussels, Belgium.

Khoja Nepesovich Evzhanov, The Institute of Chemistry of the Academy of Sciences of Turkmenistan, 744012, Ashgabat, Sovetskikh Pogranichnikov str, 92, Turkmenistan.

Sanja Fingler, Institute for Medical Research and Occupational Health, University of Zagreb, Ksaverska cesta, POB 291, 41001 Zagreb, Croatia.

Jasna Franekić, Faculty of Food Technology and Biotechnology, Laboratory of Biology and Microbial Genetics, University of Zagreb, Kršnjavoga 25, 41000 Zagreb, Croatia.

Zlatko Fröbe, Institute for Medical Research and Occupational Health, University of Zagreb, Ksaverska cesta 2, POB 291, 41001 Zagreb, Croatia.

Sharolta Gundy, Department of Human Genetics & Teratology, National Institute of Hygiene, WHO Collaborating Centre, Gyáti Utca 2-6, H-1097 Budapest, Hungary.

Oya Gürel, Department of Environmental Engineering, Dokuz Eylül University, Faculty of Engineering, Bornova 35100, Izmir, Turkey.

H. Paul A. Illing, Health & Safety Executive, Magdalen House, Stanley Precinct, Bootle, Merseyside L20 3QZ, England.

Costas Ioannides, School of Biological Sciences, University of Surrey, Guildford, Surrey GU2 5XH, England.

Don Isenberg, Microbics Corporation, 2232 Rutherford Road, Carlsbad, CA 92008, United States of America.

Farhat N. Jaffery, Ecotoxicology Division, Industrial Toxicology Research Centre, Lucknow U.P. 226001, India.

Genadijus Jonauskas, Centre for Environmental Medicine, Lithuanian Ministry of Health, Didžioji st 22, 2024 Vilnius, Lithuania.

Aga Mamedovich Khojamamedov, Centre of Environmental Medicine, Academy of Sciences of Turkmenistan, 744012, Ashgabat, Sovetskikh Pogranichnikov str, 92, Turkmenistan.

Derek J. Knight, SafePharm Laboratories Ltd., PO Box No. 45, Derby DE1 2BT, England.

Blanka Krauthacker, Institute for Medical Research and Occupational Health, University of Zagreb, Ksaverska cesta 2, POB 291, 41001 Zagreb, Croatia.

Prabhu Kulkarni, Loctite International, New Business Development - Europe, Tallaght Business Park, Whitestown, Tallaght, Dublin 24, Ireland

Yuri Kundiev, Academy of Sciences of the Ukraine, Institute for Occupational Health, WHO Collaborating Centre, 75 Saksagansky Street, 2520033 Kiev, Ukraine.

David F.V. Lewis, School of Biological Sciences, University of Surrey, Guildford, Surrey GU2 5XH, England.

Shen Li, Scientific Information, CAPM, Chinese Academy of Preventive Medicine, WHO Collaborating Centre, 10 Tian Tan XI Li, Beijing, China

Jenő Major, Department of Human Genetics & Teratology, National Institute of Hygiene, WHO Collaborating Centre, Gyáti Utca 2-6, H-1097 Budapest, Hungary.

Slobodan P. Miko, Mining-Geology-Petrology Engineering Faculty, Zagreb University, Picrottijeva 6, 41000 Zagreb, Croatia.

Herbert Motschi, ETAD, Clarastrasse 4, CH-4005 Basel, Switzerland.

Aysen Müezzinoğlu, Department of Environmental Engineering, Dokuz Eylül University, Faculty of Engineering, Bornova 35100, Izmir, Turkey.

Devika Nag, Department of Neurology, King George's Medical College, Lucknow 226001, U.P. India.

Ksenija Namjesnik, Mining-Geology-Petrology Engineering Faculty, Zagreb University, Picrottijeva 6, 41000 Zagreb, Croatia.

Brendon J. Nangle, Loctite International, New Business Development - Europe, Tallaght Business Park, Whitestown, Tallaght, Dublin 24, Ireland

Mustafa Odabaşı, Department of Environmental Engineering, Dokuz Eylül University, Faculty of Engineering, Bornova 35100, Izmir, Turkey.

Ladislav Palinkaš, Mining-Geology-Petrology Engineering Faculty, Zagreb University, Picrottijeva 6, 41000 Zagreb, Croatia.

Sheila Pantry, Sheila Pantry Associates, 85 The Meadows, Todwick, Sheffield S31 0JG, England

Dražena Papeš, Faculty of Food Technology and Biotechnology, Laboratory of Biology and Microbial Genetics, University of Zagreb, Kršnjavoga 25, 41000 Zagreb, Croatia.

Dennis, V. Parke, School of Biological Sciences, University of Surrey, Guildford, Surrey GU2 5XH, England.

Peter Pembleton, Industrial & Technological Information Section, United Nations Industrial Development Organization, Vienna International Centre, PO Box 300, A-1400 Vienna, Austria.

Simon Pirc, Faculty of Natural Sciences and Technology, University of Ljubljana, Aškerčeva 20, 61000 Ljubljana, Slovenia.

Jelena Pompe-Gotal, Veterinary Faculty, Zagreb University, Heinzelova 55, 41000 Zagreb, Croatia.

Julius Ptashkas, Centre of Environmental Medicine, Lithuanian Ministry of Health, Didžioji 22, 2024 Vilnius, Lithuania.

Elsa Reiner, Institute for Medical Research and Occupational Health, University of Zagreb, Ksaverska cesta 2, POB 291, 41001 Zagreb, Croatia.

Mervyn Richardson, BASIC, 6 Birch Drive, Maple Cross, Rickmansworth, WD3 2UL, Hertfordshire, England.

Boris L. Rubenchik, Head of Laboratory of Ecology, R.E. Kavetsky Institute for Experimental Pathology, Oncology and Radiobiology, Academy of Sciences of Ukraine 45 Vasikovskaya str., 252022, Kiev-22, Ukraine.

Dr. Motako Saito, Mitsubishi-kasei Institute of Toxicological and Environmental Sciences, 1000 Kamoshida-cho, Midori-ku, Yokohama 227, Japan.

William Seddon-Brown, European Government Affairs, Waste Management International, Avenue de Tervuren 13-B, 1040 Brussels, Belgium

Tadayoshi Shigeoka, Mitsubishi-kasei Institute of Toxicological and Environmental Sciences, 1000 Kamoshida-cho, Midori-ku, Yokohama 227, Japan.

Garislav Shkolenok, United Nations Environment Programme, International Register of Potentially Toxic Chemicals, Case Postale 356, 15 Chemin des Anémones, CH-1219 Châtelaine, Geneva, Switzerland.

Nerida Smith, The National Toxicology Group, Medical School, University of Otago, PO Box 913, Dunedin, New Zealand.

Emil Srebočan, Veterinary Faculty, Zagreb University, Heinzelova 55, 41000 Zagreb, Croatia.

Eva Susanszky, Department of Human Genetics & Teratology, National Institute of Hygiene, WHO Collaborating Centre, Gyáti Utca 2-6, H-1097 Budapest, Hungary.

Wayne Temple, The National Toxicology Group, Medical School, University of Otago, PO Box 913, Dunedin, New Zealand.

Harri Vainio, Unit of Carcinogen Identification and Evaluation, International Agency for Research on Cancer, World Health Organization, 150 Cours Albert Thomas, 69372-Lyon, Cedex 08, France.

Mihaela Vasilescu, Institute of Hygiene & Public Health, Department of Environmental Hygiene, Str. Dr. Leonte 1-3, 76256 Bucharest, Romania.

Tatjana Vergieva, Department of Toxicology, Institute of Hygiene and Occupational Health, D. Nestorov 15, Sofia 1431, Bulgaria.

Nabil Watfa, Occupational Safety & Health Branch, Working Conditions/Environment Department, International Labour Office, 4 Route des Morillons, CH-1211 Geneva 22 Switzerland.

Julian Wilbourn, International Agency for Research on Cancer, World Health Organization, 150 Cours Albert Thomas, 69372-Lyon, Cedex 08, France.

Dr. Kituo Yoshida, Mitsubishi-kasei Institute of Toxicological and Environmental Sciences, 1000 Kamoshida-cho, Midori-ku, Yokohama 227, Japan.

Skirmante Zhlabyte, Centre of Environmental Medicine, Lithuanian Ministry of Health, Didžioji St. 22, 2104 Vilnius, Lithuania.

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