

CONTENTS

ACKNOWLEDGEMENTS	xv
MEMBERS OF THE ORGANIZING COMMITTEES	xvi
EDITOR'S NOTE	xix
FOREWORD	xxi
IN MEMORIAM - TAKEHIKO SHIMANOUCHI	xxii
PROCEEDINGS	
<u>PRESIDENTIAL ADDRESS</u> - MASAO KOTANI, President CODATA, Science University of Tokyo	1
<u>KEYNOTE ADDRESSES</u>	
Production and Use of Data in the Pure and Applied Sciences - P.H. ABELSON, Editor, Science, American Association for the Advancement of Science, Washington, D.C. (U.S.A.)	5
Data for the Development of Human Settlements in a Dynamic World - ARCOT RAMACHANDRAN, Executive Director, United Nations Centre for Human Settlements (HABITAT), Nairobi (Kenya)	10
Informatical Analysis of Scientific Research Activities - TOSIO KITAGAWA, Director of International Institute for Advanced Study of Social Information Science, Honorary Professor of Kyushu University (Japan)	16
<u>BIOSCIENCES</u>	
Data on Our Evolutionary Heritage - MOTOO KIMURA, National Institute of Genetics, Mishima, 411 (Japan)	23
Computerized Gas Chromatography - Mass Spectrometry in Biomedical Studies. Coordina- tion and Handling of the Data - E. JELLMØ, Institute of Clinical Biochemistry, Rikshospitalet, University of Oslo, Oslo 1 (Norway)	30
Data Collection From 2-Dimensional Gel-Electrophoreses Experiments - S. PETER SPRAGG, Department of Chemistry, University of Birmingham, Birmingham B15 2TT (U.K.)	33
The Generation of Diversity of Antibodies: A Problem of Combinatorial Analysis - A. BUSSARD, Institut Pasteur, Paris (France)	38
Higher Order Activities of Biological Systems - KENSUKE SATO, Research Foundation on Traffic Medicine, 1-9-3, Higashi Ikebukuro, Toshima-ku, Tokyo; Chikusui-kai Research Institute for Neuro-information, Yame City, Fukuoka (Japan)	43
Compilation and Evaluation of Radiation Depth Dose Data From Electron Accelerators Used for Radiotherapy: Experiences of a Pilot Data Project in a Hospital Environment - S.P. FIVOZINSKY, Office of Standard Reference Data, National Bureau of Standards, Washington, DC 20234 (U.S.A.) and J.A. PURDY, Mallinckrodt Institute of Radiology, Washington University School of Medicine, St. Louis, MO 63110 (U.S.A.)	50

A New Computer Program for Chemical Diagnosis of the Metabolic Diseases - I. MATSUMOTO, T. KUHARA, T. SHINKA, Research Institute of Medical Mass Spectrometry, Kurume University, School of Medicine, Kurume, Fukuoka (Japan); T. MIZUNO, H. TESHIMA and N. ABE, MS Group, Scientific Instrument Division, Japan Electrom Optics Ltd., Akishima, Tokyo (Japan)	55
Evaluation of Neuronal Spike Train Data by New Methodologies of Waveform Discrimina- tion and Point Process Analysis - MASAO NAKAMURA, Department of Information Science, Faculty of Engineering, Fukui University, Fukui (Japan); YOSHIHIKO OGATA, Institute of Statistical Mathematics, Minato-ku, Tokyo (Japan); and YUTAKA OOMURA, Department of Physiology, School of Medicine, Kyushu Universi- ty, Fukuoka (Japan)	59
ERGODATA, an International Data Bank in Biometry and Ergonomics: Conversational use and Development of the Data Bank - A. COBLENTZ, G. IGNAZI, J. BOUDARD, and R. STECK, Laboratoire d'Antropologie et d'Ecologie Humaine, 45, rue des Saints-Pères, 75006 Paris (France)	63
The Automation of Human Fertility Analysis - G. BAR-OR and I. PAZ, The Signal Proces- sing Laboratory of Electrical Engineering Department at the Technion, Israel Institute of Technology, Haifa (Israel)	67
The Use of Cluster Analysis and Display Method of Pattern Recognition in Structure- Activity Studies of Antibiotics - Y. MIYASHITA, Y. TAKAHASHI, H. ABE, and S. SASAKI, Toyohashi University of Technology, Tempaku, Toyohashi, 440 (Japan) and Y. YOTSUI, Daiichi Seiyaku Co. Ltd., Edogawa-ku, Tokyo 132 (Japan)	71
Development of a National Information System of Laboratory Organisms - H. SUGAWARA, Y. TATENO, Office for Life Science Promotion, Institute of Physical and Chem- ical Research, Tokyo 113 (Japan) and N. SAKAMOTO, Institute of Information Sciences and Electronics, The University of Tsukuba, Ibaraki 305 (Japan)	76
On the Use of a Data Base System for Information Processing in Plant Breeding - SHIGERU SUZUKI, Division of Genetics, National Institute of Agricultural Sciences, Tsukuba (Japan)	80
On-Line Information Retrieval System on Protein Structure Data and Interactive Graphics Display in Protein Crystallography - M. TAKETANI, Y. IGA, Y. MATSUURA, N. YASUOKA, and M. KAKUDO, Institute for Protein Research, Osaka University, Suita, 565 (Japan); and Y. ISOMOTO, The Computation Center, Osaka University, Suita, 565 (Japan)	84
Systematic Information Retrieval and Directional Data Analysis of Oligopeptide Units in Protein Data Bank - K. KITAMURA, A. WAKAHARA, M. SUNADA, and K. TOMITA, Faculty of Pharmaceutical Sciences, Osaka University, 133-1 Yamada-Kami, Suita, Osaka 565 (Japan); Y. BABA, The Institute of Statistical Mathematics, 4-6-7 Minamiazabu, Minato-ku, Tokyo 106 (Japan); Y. MATSUURA, N. YASUOKA and M. KAKUDO, Institute for Protein Research, Osaka University, 5311 Yamada- kami, Suita, Osaka 565 (Japan)	88
Basic Requirement for Operating Sub-Center Work in Data Processing System. A Model Case in Research Field of Peptide - Y. SETO and S. SAKAKIBARA, Peptide Institute, Protein Research Foundation, Minoh, Osaka 562 (Japan)	92
Construction of Numerical Descriptions of Groups of Microbes from Binary Data - CYNTHIA A. WALCZAK, Microbial Systematics Section, National Institute of Dental Research, National Institutes of Health, Bethesda, MD 20205 (U.S.A.)	95
Data Contents and Processing in a National Information System of Laboratory Organisms - Y. TATENO, H. SUGAWARA, Office for Life Science Promotion, Institute of Physical and Chemical Research, Tokyo 113 (Japan); and N. SAKAMOTO, Institute of Information Sciences and Electronics, The University of Tsukuba, Ibaraki 305 (Japan)	98
A Medical Record Database for the A-Bomb Survivors - T. NAKAMURA, H. MORI, M. MINE, H. KONDO, S. OKAJIMA, Nagasaki University School of Medicine, Nagasaki (Japan) and E. YOSHIDA, Japan IBM Corp., Fukuoka Branch, Fukuoka (Japan)	102
Data Base of the Interpretations of Automated ECG Analysis - Y. NOSE, K. YAMAGISHI, R. NOSE, T. SHIBAHARA, O. NAKAGAKI, T. INOUE, Y. WATANABE, M. YOKOTA, M. NAKAMURA, Information Science Laboratory for Bio-medicine, Kyushu Univer- sity Hospital, Fukuoka, 812 (Japan); S. TATEISHI, and Y. MIMURA, Japan IBM Corp., Fukuoka Branch, Fukuoka, 812 (Japan)	106

Collection, Storage and Dissemination of Clinically Useful Data -- An Experience with Drug Data - NOBORU KAWAMURA, Tokyo Metropolitan Institute of Gerontology, 35-2 Sakae-Cho, Itabashi-ku, Tokyo (Japan) and SHIGEKOTO KAIHARA, M.D., Hospital Computer Center, University of Tokyo Hospital, 7 Hongo, Bunkyo-ku, Tokyo 113 (Japan)	109
Cluster Analysis of Microbiological Data in Oversize Data Bases - MICAH I. KRICHEVSKY and CYNTHIA A. WALCZAK, Microbial Systematics Section, National Institute of Dental Research, National Institutes of Health, Bethesda, MD 20205 (U.S.A.)	112
 GEOSCIENCES	
 <u>GENERAL</u>	
Attitudes Toward Data in the Hard and Medium-Hard Sciences - FELIX CHAYES, Geophysical Laboratory, Carnegie Institution of Washington, 2801 Upton St., N.W., Washington, DC 20008 (U.S.A.)	116
Interactive Graphic Data Entry and Display for the Geo-Database System - KIYOSHI WADATSUMI, Department of Geosciences, Osaka City University, Osaka 558 (Japan)	122
 <u>NATURAL RESOURCES, CARTOGRAPHY</u>	
Quantitative Integration of Mineral Exploration Data From the Grong Mining District Norway - RICHARD SINDING-LARSEN, Norwegian Institute of Technology, 7034 Trondheim-NTH (Norway) and GEIR STRAND, Geological Survey of Norway, P.B. 3006, 7001 Trondheim (Norway)	128
The Electric Power Research Institute Water Supply Data Base: A Scarce Resource Research Tool - FRANK W. ALLEN, Management Information Systems Department, University of Arizona, Tucson, AZ (U.S.A.)	133
Microcomputers and the Aggregation of Field Data in the South Pacific Basin - SHELDON C. BACHUS, United Nations Development Programme, Private Mail Bag, Apia (Western Samoa)	137
Correspondencies Analysis in Thematic Cartography - D. LEFEBVRE, Equipe HBDS, Laboratoire de Géodynamique, Tour 15-25, 1er étage, Université P. et M. Curie, 4, place Jussieu, 75230 Paris Cedex 05 (France)	141
Pattern Recognition and Cartographic Themes Combination for Water Resources Mapping - C. DAVID, Equipe HBDS, Laboratoire de Géodynamique, Tour 15-25, 1er étage, Université P. et M. Curie, 4, place Jussieu, 75230 Paris Cedex 05 (France)	145
Digital Processing of Space Imagery for Topographic and Thematic Mapping: The French Spot Project - A. BAUDOIN, D. KIRSNER, Institut Géographique National, Saint-Mandé (France) and J.C. CAZAUX, Centre National d'Etudes Spatiales, Toulouse (France)	149
The French Subsoil Data Bank of the Bureau de Recherches Géologiques et Minières: Objectives, Options and Facilities - J.P. LEPRETRE, B.R.G.M., B.P. 6009, 45018 Orléans Cedex (France)	153
The Biwa System as a Prototype Data Base to Manage Various Kinds of Data in Geology and Related Sciences - N. NISHIWAKI, K. YAMAMOTO, Dept. Geol. Mineral., Fac. Sci., Kyoto University, Kyoto 606 (Japan) and K. WADATSUMI, Dept. Geosci., Fac. Sci., Osaka City University, Osaka 558 (Japan)	156
The Use of "Digital National Land Information": Present State and Future Possibilities - T. KANAKUBO and K. NOMOURA, Geographical Survey Institute, Kitazato 1, Yatabe-mati, Tukuba-gun, Ibaraki-ken, 305 (Japan)	161
 <u>ENVIRONMENT</u>	
SMLESIS - Database for Multidisciplinary Research with Application to Environmentology - YASUO SHIMAZU and TATSUO URABE, Department of Earth Science, Nagoya University, Chikusa, Nagoya, 464 (Japan)	164
Current and Potential Applications of Remote Sensing Satellite Data in Oceanography - J.M. MONGET, Ecole Nationale Supérieure des Mines de Paris, Sophia-Antipolis, Valbonne 06560 (France)	169
Environmental Equation of State of the Earth as a Habitat - MICHELE CAPUTO, Istituto di Fisica "G. Marconi", Università di Roma (Italy)	174

Information Needs of Environmental Management Systems - NENAD PRELOG, Referral Centre of the University of Zagreb, Trg Marsala Tita 3, 4100 Zabreb (Yugoslavia)	176
The Status and Problems on Climatic Data in Japan - R. YAMAMOTO, Geophys. Inst., Kyoto University, Kyoto 606 (Japan), E. UCHIDA, Meteor. Res. Inst., Japan Meteor. Agency, Yatabe-cho, Ibaragi-Pref. 305 (Japan) and K. WATANABE, Meteor. Satellite Center, Japan Meteor. Agency, Kiyose-Shi, Tokyo-To, 180-04 (Japan)	179
Some Problems on Data Related Air Pollution Meteorology - TAKESHI KAWAMURA, Institute of Geoscience, University of Tsukuba, Ibaraki, 305 (Japan)	185
Problems of Data in Local and Micro-Scale Climatology and Meteorology - MASATOSHI M. YOSHINO, Institute of Geoscience, University of Tsukuba, Ibaraki, 305 (Japan)	189
The Principal Offshore Oil-Spill Accidents and Tanker Casualties Databank (1955-1980) Compiled by the Institut Francais du Pétrole - ALAIN BERTRAND, Institut Francais du Pétrole, 1 et 4 avenue de Bois Préau, 92506 Rueil Malmaison (France)	193
 <u>ASTRONOMY</u>	
Dissemination of Data in Astronomy and Astrophysics - B. HAUCK, Institut d'Astronomie de l'Université de Lausanne, 1290 Chavannes-des-Bois (Switzerland)	198
Compilation of Machine-Readable Astronomical Data Files - AKIRA UESUGI, Department of Astronomy, Kyoto University, Koyto, 606 (Japan) and ICHIRO FUKUDA, Kanazawa Institute of Technology, Kanazawa, 921 (Japan)	201
Data Management Techniques Applied to Machine-Readable Astronomical Data - Y. TERASHITA and A. KITAMURA, Computer Center, Kanazawa Institute of Technology, Kanazawa 921 (Japan)	205
The Retrieval System for the Stellar Bibliography in Japan - S. NISHIMURA, Tokyo Astronomical Observatory, University of Tokyo, Mitaka, Tokyo 181 (Japan)	209
 <u>PHYSICS, CHEMISTRY</u>	
<u>GENERAL AND ENERGY APPLICATION</u>	
Numerical Data Banks in Physics: What Has Been Done, What Should Be Done - H. BEHRENS and G. EBEL, Fachinformationszentrum Energie Physik Mathematik GmbH, Karlsruhe (Federal Republic of Germany)	212
The Impact of a Data Base on Elementary Particle Physics Research in the U.K. - F.D. GAULT, Particle Data Group, Physics Department, University of Durham, Durham, DH1 3LE (England)	219
Database and Retrieval-Display System of Atomic Data for Thermonuclear Fusion Research - Y. ITIKAWA, T. KATO, Research Information Center, and Y. KANADA, and R. WATANABE, Computer Center, Institute of Plasma Physics, Nagoya University, Nagoya 464 (Japan)	223
Development of a Computer Assisted Documentation and Information Retrieval for Molecular Physics in the Gaseous Phase - H.-G. SCHIRDEWAHN, Computer Center of the University of Freiburg (F.R.G.) and B. MEZ-STARCK, Section for Structure Documentation, University of Ulm (Federal Republic of Germany)	227
Compilation of Nuclear Reaction Data in Japan - M. TOGASI and H. TANAKA, Department of Physics, Faculty of Science, The Hokkaido University, Sapporo (Japan)	233
Screening of Latent Heat-Thermal Energy Storage Materials by Using Evaluated Thermo-dynamic Data - T. OZAWA, M. KAMIMOTO, R. SAKAMOTO, Y. TAKAHASHI, and K. KANARI, Electrotechnical Laboratory, 1-4 Umezono 1-chome, Sakura-mura, Niihari-gun, Ibaraki 305 (Japan)	237
New Thermodynamic Functions Relevant to Conservation of Energy -- Theta Function and Reference Exergy of Elements - S. YAMAUCHI and K. FUEKI, Department of Industrial Chemistry, Faculty of Engineering, University of Tokyo, Hongo, Bunkyo-ku, Tokyo (Japan)	242
On the Criteria for the Determination of the Best Values of Constants - V.S. TOUNINSKY and K.A. KRASNOV, Mendeleyev Institute of Metrology, Leningrad (U.S.S.R.)	246

GAPHYOR: A Computerized Retrieval System on Properties of Atoms, Molecules and Gases - J.M. MERMET, Laboratoire de Physicochimie Industrielle, INSA, Bât. 401, 69621 Villeurbanne Cedex (France) and J.L. DELCROIX, Laboratoire de Physique des Gaz et des Plasmas, Bât. 212, Université Paris-Sud, 91405 Orsay Cedex (France) This address must be used for the GAPHYOR System	250
EROICA Database: A Database for Fundamental Physical Properties of Organic and Organo-metallic Compounds - YUKIO YONEDA, Department of Synthetic Chemistry, Faculty of Engineering, University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113 (Japan)	254
The Use of the EPIC Data Bank in Energy Accounting Studies - B. KALITVENTZEFF, E.R.M. avenue de la Renaissance 30, B-1040 Bruxelles and Université de Liège, rue A. Stévart 2, B-4000 Liège (Belgium) and C. RENSON, G. HEYEN and R. GOSSET, Université de Liège, rue A. Stévart 2, B-4000 Liège (Belgium)	258
 <u>SPECTROSCOPY</u>	
Preliminary Research for the Establishment of Spectral Data Bank in National Chemical Laboratory for Industry - S. SAÉKI and O. YAMAMOTO, National Chemical Laboratory for Industry, Tsukuba, Ibaraki 305 (Japan)	262
Wavenumber Standards in the Infrared - A.R.H. COLE, School of Chemistry, University of Western Australia, Nedlands (Western Australia)	266
New Developments in Infrared Spectral Data Coding - CLARA D. CRAVER, Chemir Laboratories, Glendale, MO 63122 (U.S.A.), ELIZABETH M. KIRBY, Ontario Research Foundation, Sheridan Park, Mississauga, Ontario, L5K 1B3 (Canada) and R. NORMAN JONES, Department of Chemistry, Tokyo Institute of Technology, Ohokayama, Meguro-ku, Tokyo 152 (Japan)	274
An Efficient Search Program (KISS) for ASTM Infrared Spectral Data - K. TANABE, T. TAMURA, J. HIRAISHI, and S. SAÉKI, National Chemical Laboratory for Industry, Tsukuba, Ibaraki 305 (Japan)	278
A Carbon-13 NMR Database for Advanced Research in Polymers - Y. FUJIWARA, Institute of Information Science and Electronics, The University of Tsukuba, Sakuramura, Niihari-gun, Ibaraki 305 (Japan), where correspondence should be addressed, K. HATADA, Department of Chemistry, Faculty of Engineering Science, Osaka University, T. HIRANO, T. KAWAMURA, K. MATSUZAKI, Faculty of Engineering Science, University of Tokyo, S. KONDO, Department of Chemistry, Tokyo College of Science, A. NISHIOKA, Foundation of Advanced International Science, Y. TANAKA, Tokyo College of Agriculture and Engineering, and B. TOMITA, Faculty of Agriculture, University of Tokyo (Japan)	283
A Carbon-13 and Proton NMR Spectral Data Retrieval System: Spires - H. ABE, S. SASAKI, School of Materials Science, Toyohashi University of Tech., Hibarigaoka, Tempaku, Toyohashi 440 (Japan), K. TANAKA and H. OSADA, Asahi Research Center Co., Ltd., 1-2 Yuraku-cho 1-chome, Chiyodaku 100 (Japan)	287
Personal Literature Database Construction for Nuclear Magnetic Resonance - AKIRA YAMASAKI, Laboratory of Applied Chemistry, The University of Electro-Communications, Chofu, Tokyo 182 (Japan)	291
Retrieval and Simulation of UV Photoelectron Spectra of Organic Molecules - P.K. BASU, M.K. UPPAL and C.N.R. RAO, Solid State and Structural Chemistry Unit, Indian Institute of Science, Bangalore 560012 (India)	295
 <u>"STRUCTURAL" CHEMISTRY, CRYSTALLOGRAPHY</u>	
Critical Evaluation and Compilation of Molecular Geometry Data Determined by Gas Electron Diffraction - KOZO KUCHITSU, Department of Chemistry, Faculty of Science, The University of Tokyo, Hongo, Bunkyo-ku, Tokyo 113 (Japan)	297
Evaluation of Raman Spectral Data - J. HIRAISHI, S. SAÉKI, National Chemical Laboratory for Industry, Yatabe, Ibaraki 305 (Japan) and the late T. SHIMANOUCHI, University of Tsukuba, Sakuramura, Ibaraki 305 (Japan)	300
The JICST On-Line Mass Spectral Search System - H. NAKAI, H. UCHIDA, N. ONODERA, T. MOROOKA, M. SATO, The Japan Information Center of Science and Technology, Nagatacho, Chiyoda-ku, Tokyo (Japan), and T. OSADA, Resource Sharing Co., Akashicho, Chuo-ku, Tokyo (Japan)	304

Present Status of Users and Contributors of Mass Spectral Data in Japan - COMMITTEE ON MASS SPECTROMETRY DATA BASE, Mass Spectroscopy Society of Japan, Chiba Inst. Tech., Narashino, Chiba (Japan)	309
Geometrical Structure of Carbonyl Chloride: A Case Study of the Complementary Use of Gas Electron Diffraction and Microwave Spectroscopy - MUNETAKA NAKATA, TSUTOMU FUKUYAMA, KOZO KUCHITSU, Department of Chemistry, Faculty of Science, The University of Tokyo, Hongo, Bunkyo-ku, Tokyo 113 (Japan), HARUTOSHI TAKEO, and CHI MATSUMURA, National Chemical Laboratory for Industry, Tsukuba-gun, Ibaraki 305 (Japan)	313
Creation and Capabilities of Computerized Data Banks Containing Information on Chemical Structures and Properties - V.A. KOPTYUG, G.P. ULYANOV, V.N. PIOTRKH- PELETSKY, B.G. DERENDYAEV and M.I. PODGORNOY, Institute of Organic Chemistry and Scientific Information Centre on Molecular Spectroscopy of Siberian Division of the Academy of Sciences, Novosibirsk (U.S.S.R.)	316
Inorganic Crystal Structure Database - G. BERGERHOFF, Institut für Anorganische- Chemie, University of Bonn (Federal Republic of Germany) and I.D. BROWN, Institute for Materials Research, McMaster University, Hamilton, Ontario L8S 4M1 (Canada)	324
Mineral and Inorganic Crystal Database - GEN SATO, HIROSHI TAKEDA, YOSHIO TAKEUCHI, Mineralogical Institute, Faculty of Science, University of Tokyo Hongo, Tokyo (Japan), and MASAMICHI MIYAMOTO, Department of Pure and Applied Science, College of General Education, University of Tokyo, Komaba, Tokyo (Japan)	327
An Intermolecular Contact Check for Crystal Structure Data - K. OSAKI, Faculty of Pharmaceutical Sciences, Kyoto University, Sakyo-ku, Kyoto 606 (Japan)	332
Molecular and Crystal Data System. II. - The late TAKEHIKO SHIMANOUCHI, MITSUO TASUMI, Department of Chemistry, Faculty of Science, University of Tokyo, Hongo 7-3-1, Bunkyo-ku, Tokyo 113 (Japan), and ISAO SUZUKI, Institute of Information Sciences and Electronics, University of Tsukuba, Sakura-mura, Niihari-gun, Ibaraki 305 (Japan)	336
Accumulation of Atomic Coordinates Not Printed in Crystal Structure Reports - K. OSAKI, Faculty of Pharmaceutical Sciences, Kyoto University, Sakyo-ku, Kyoto 606 (Japan) and N. YASUOKA, Crystallographic Research Center, Institute for Protein Research, Osaka University, Yamada-kami, Suita 565 (Japan)	339
The NIH-EPA Chemical Information System (CIS) - STEPHEN R. HELLER, Environmental Protection Agency, PM-218, Washington, DC 20460 (U.S.A.) and GEORGE W.A. MILNE, NHLBI, NIH, Bethesda, MD 20205 (U.S.A.)	343
Compact Description of Chemical Structures - YOSHIHIRO KUDO, Japan Association for International Chemical Information (JAICI), Tokyo 113 (Japan)	347
Automorphism Partitioning of Vertices of a Chemical Graph - M. UCHINO, Laboratory of Resources Utilisation, Tokyo Institute of Technology, 4259 Nagatsudacho, Midoriku, Yokohama 227 (Japan)	350
Adjacent Name Fragment Pair - A New Search Key to Chemical Substances - SOICHI TOKIZANE, Japan Association for International Chemical Information, Tokyo 113 (Japan) and HIDEAKI CHIHARA, Faculty of Science, the Osaka University, Toyonaka 560 (Japan)	354
Computer-Based Compilation and Filing of Electrochemical Kinetic Parameters - H. SATO, K. NIKI, Faculty of Engineering, Yokohama National University, Tokiwadai 156, Hodogaya-ku, Yokohama 240 (Japan) and R. TAMAMUSHI, The Institute of Physical and Chemical Research, Wako, Saitama 351 (Japan)	357
<u>THERMODYNAMICS, THERMOPHYSICAL PROPERTIES, MATERIALS</u>	
Handling and Evaluation of Large Networks of Thermochemical Data - DONALD D. WAGMAN, DAVID GARVIN, VIVIAN B. PARKER, WILLIAM H. EVANS, J. BRIAN PEDLEY, U.S. National Bureau of Standards, Washington, DC (U.S.A.), and PHILIP M. BURKINSHAW, University of Sussex, Brighton (U.K.)	361
Joint Proceedings of Thermal, Calorical and Acoustical Experimental Data for Compila- tion of Thermodynamic Tables - V.V. SYTCHEV and G.A. SPIRIDONOV, Moscow Power Engineering Institute, Krasnokazarmennaya 17, Moscow E-250 (U.S.S.R.)	369

The IVTAN Data Bank on the Thermodynamic Properties of Individual Substances - LEV V. GURVICH, VADIM K. POLYSHCHUK, VLADIMIR S. YORISH, and VLADIMIR S. YUNGMAN, Institute for High Temperatures, USSR Academy of Science, Korovinskoye Shausse, Moscow 127412 (U.S.S.R.)	371
Planning of a High Pressure Data Bank (PIEZODATA) - B. VODAR, LIMHP-CNRS Villetaneuse, AIRAPT-BOURGOGNE, 71200 Le Creusot (France)	93430 374
Perfect Gas Thermodynamic Properties of Simple Chemical Substances - JING CHAO and KENNETH R. HALL, Thermodynamics Research Center, Texas Engineering Experiment Station, Texas A&M University, College Station, TX 77843 (U.S.A.)	376
The Fluid Phase Equilibrium Data Project of the IUPAC Subcommittee on Thermodynamic Tables - H.V. KEHIAIAN, CNRS, Marseille (France), F. KOHLER, University, Bochum (F.R.G.), S. MALANOWSKI, PAN, Warsaw (Poland), and H.J. WHITE, JR., NBS, Washington, DC (U.S.A.)	381
Necessity for Establishing the Skeleton Tables on the Thermodynamic Properties of Fluids - J. STRAUB, K. SCHEFFLER, N. ROSNER, Technische Universität München (F.R.G.), K. WATANABE, M. UEMATSU, and H. SATO, Keio University (Japan)	384
Prediction of Thermodynamic and Transport Properties of Fluids by Means of the Significant Liquid Structure Theory - W. NOWAK, Institut für Technische Thermodynamik und Thermische Verfahrenstechnik der Universität Stuttgart, Pfaffenwaldring 9, 7000 Stuttgart 80 (Federal Republic of Germany)	389
Chemical Thermodynamic Properties of Coal Chemicals: Aromatic Hydrocarbons - S.A. KUDCHADKER, P.K. PARANJAPE and A.P. KUDCHADKER, Department of Chemical Engineering, Indian Institute of Technology Bombay, Powai, Bombay 400 076 (India)	394
Recent Activities of the Japanese Research Committee on Thermophysical Properties of Fluids - T. MAKITA, Y. TANAKA, Department of Chemical Engineering, Kobe University, Nada-ku, Kobe 657 (Japan), K. DATE, Hachinoe Institute of Technology, H. IWASAKI, S. TAKAHASHI, Tohoku University, K. WATANABE, A. NAGASHIMA, Keio University, K. OGUCHI, Ikutoku Tech. University, J. OSUGI, Y. TAKEZAKI, N. SUGITA, Kyoto University (Japan)	399
A New Database on the Thermophysical Properties of Fluids - T. MAKITA, Y. TANAKA, Dept. of Chem. Eng., T. TAKAMORI, Dept. of Instr. Eng., Faculty of Eng., and Y. TAKAOKA, Computation Center, Kobe University, Nada-ku, Kobe 657 (Japan)	403
Thermodynamic and Phase Diagram Data of Metal-Sulfur Systems - Y. AUSTIN CHANG, Dept. of Metallurgical and Mineral Engineering, Univ. of Wisconsin-Madison, 1509 University Avenue, Madison, WI 53706 (U.S.A.)	407
Application of the Tait Equation to the Determination of Thermophysical Properties of Fluids Under Pressure - B. LE NEINDRE and R. TUFEU, L.I.M.H.P.-C.N.R.S. Université Paris-Nord, avenue Jean-Baptiste Clément, 93430 Villetaneuse (France)	411
Vapor Pressure Data of Simple Organic Substances, Their Availability and Reliability - E. HOFFMANN, National Center of Scientific and Technological Information, 84 Hachashmonaim St., P.O. Box 20125, Tel Aviv 61200 (Israel)	415
Recent Developments in the Collection, Critical Evaluation, and Publication of Polarographic and Related Data - L. MEITES, P. ZUMAN, E. RUPP, and A. NARAYANAN, Department of Chemistry, Clarkson College of Technology, Potsdam, NY 13676 (U.S.A.)	418
Materials Data Base for Energy Applications - S. IWATA, A. NOGAMI, S. ISHINO, Y. MISHIMA, Faculty of Engineering, University of Tokyo, Bunkyo-ku, Tokyo (Japan), Y. TAKAO, Tokyo Scientific Center, IBM Japan, Ltd., Minato-ku, Tokyo (Japan), T. ARUGA, and K. SHIRAISHI, Division of Nuclear Fuel Research, JAERI, Tokai, Ibaraki (Japan)	422
<u>ENGINEERING, INDUSTRY</u>	
Data Bases for Rapid Response to Power Reactor Problems - BETTY F. MASKEWITZ, Engineering Physics Information Centers (EPIC), Oak Ridge National Laboratory, Oak Ridge, TN 37830 (U.S.A.)	426
A Computerised Materials Database for an Automotive Manufacturer - P.M. APPOO, Systems Analyst, BNF Metals Technology Centre, Wantage, Oxon, OX12 9BJ (U.K.)	431

Data on Corrosion Protection in Electrical Power Equipment - EVA RAIMANN CABRAL, CEPEL-Electrical Energy Research Centre, P.O. Box 2754, 20000-Rio de Janeiro (Brazil)	441
Data Gaps in Respect to Organic Industrial Chemicals - M. SCHÖNBERG, Hoechst A.G., Frankfurt (Main) (Federal Republic of Germany)	447
ESDU - Fulfilling Industrial Needs for Data - KEITH W. REYNARD, Engineering Sciences Data Unit Ltd., London (England)	451
Estimation of Physical Properties From the Data File of Superconductive Materials - H. IHARA, M. YAMAZAKI, Y. KAWAGUCHI, K. WATANABE, and S. GONDA, Electro-technical Laboratory, 1-1-4 Umezono Sakura-mura, Niihari-gun, Ibaraki 305 (Japan)	457
EMPIS: A Materials Data Program of an Electrical Manufacturing Company - J.H. WESTBROOK, General Electric Company, Research and Development Center, Schenectady, NY 12305 (U.S.A.)	462
Compilation of Materials Data for Development of Specific Electronic Devices - MASAYA YABE, Fuji Electric Corporate Research and Development, Ltd., Nagasaki, Yokosuka, Kanagawa (Japan)	469

GENERAL, I.E. NON-DISCIPLINARY OR INTERDISCIPLINARY ASPECTS OF DATA MANAGEMENT

STORAGE AND DISSEMINATION

Database Management Systems for Numeric/Structured Data: An Overview - VICTOR E. HAMPEL, Lawrence Livermore Laboratory, University of California, P.O. Box 808 Livermore, CA (U.S.A.)	472
Interactive Graphical Techniques for Data Comprehension - MICHEL LUCAS, Université de Nantes, Informatique, 2 chemin de la houssinière, F-44072 Nantes Cedex (France)	478
Tool System for Computer Aided Design of Highly Performing Digital Systems - CLAUDE MICHEL and PHILIPPE CHAMBON, Sintra-Alcatel, 26 rue Malakoff, 92600 Asnières (France)	482
Application of a DBMS at NEA Data Bank: Problems and Experience with a Large Data Base on a Small Computer - N. TUBBS, D. JOHNSON, L. PELLEGRINO, W. SCHULER, OECD Nuclear Energy Agency, Data Bank, B.P. 9, 91190 Gif-sur-Yvette (France)	486
Using a Relational DBMS in the Scientific Community - STEPHEN E. JONES, Lawrence Livermore National Laboratory, Livermore, CA (U.S.A.)	491
Omnidata and Related Software as Developed and Applied by the Office of Standard Reference Data for On-Line Retrieval, Analysis, and Manipulation of NSRDS Data Bases - BETTIJOYCE BREEN MOLINO, Office of Standard Reference Data National Bureau of Standards, Bldg. 221 - Room B336, Washington, DC 20234 (U.S.A.)	500
User-Oriented Database Management System, Cood, and its Application to On-Line Data Storage and Retrieval - NOBUYUKI TANAKA, AKIFUMI YAMADA, Department of Chemistry, Faculty of Science, Tohoku University, Sendai 980 (Japan), and TAKAKO MATSUDA, Computer Center, Tohoku University, Sendai 980 (Japan)	504

DATA SYSTEM ORGANIZATION

Data Portability Between Large and Mini-Computers - F. BOUILLE, Equipe HBDS, Institut de Programmation, Université Pierre et Marie Curie, Paris (France)	508
Integrated Information and Communication System for Problem Solving: Basic Concepts - R. McCALL, JR., I. MISTRIK and W. SCHULER, Gesellschaft für Information und Dokumentation mbH, Sektion für Systementwicklung, Heidelberg (Federal Republic of Germany)	512
Information System Monitoring and Analysis to Support the Evaluation of Computerized Access to On-Line Data Bases: Part I. Monitoring - W.D. DOMINICK, Comp. Sci. Dept., Univ. of Southwestern Louisiana & Information Management, Inc., Lafayette, LA (U.S.A.) and W.D. PENNIMAN, Development Div., OCLC, Inc., Columbus, OH (U.S.A.)	517

Information System Monitoring and Analysis to Support the Evaluation of Computerized Access to On-Line Data Bases: Part II. Analysis - W.D. PENNIMAN, Development Div., OCLC, Inc., Columbus, OH (U.S.A.) and W.D. DOMINICK, Comp. Sci. Dept., Univ. of Southwestern Louisiana & Information Management, Inc., Lafayette, LA (U.S.A.)	521
Synthesis of Scientific Information Using Large-Scale Bibliographic Database - S. MIYAMOTO, K. NAKAYAMA, Scientific Information Processing Center, The University of Tsukuba, Ibaraki (Japan), and T. AOKI, Oita Technical College, Oita (Japan)	525
Integrating Data, From Different Sources, at Different Scales - F. BOUILLE, Equipe HBDS, Institut de Programmation, Université Pierre et Marie Curie, Paris (France)	530
Data Element Standardization: A Methodology for Describing Numeric Data - R.E. NOLAN, Herner & Company, 1700 N. Moore St., Arlington VA 22209 (U.S.A.) and V K.M. WHITNEY, Arthur D. Little, Inc., Acorn Park, Cambridge, MA 02140 (U.S.A.)	535
A Model of Topological Spatial Database System for Unified Description and Management of Various Data, SEIICHI UCHINAMI and YOSHIKAZU TEZUKA, Faculty of Engineering, Osaka University, Yamada-kami, Suita, Osaka 565 (Japan)	540
QCLDB - Quantum Chemistry Literature Data Base - M. TOGASI, Dept. of Physics, Hokkaido Univ., Sapporo 060; H. HOSOYA, Dept. of Chem., Ochanomizu Univ., Bunkyo-ku, Tokyo 112; Y. OSAMURA, Dept. of Chem., Osaka City Univ., Sumiyoshi-ku, Osaka 558 and Dept. of Phys., Hokkaido Univ., Sapporo 060; S. YAMABE, Fac. of Education, Nara Univ. of Education, Nara 630, F. HIROTA, Dept. of Chem., Shizuoka Univ., Ohya, Shizuoka 422; S. IWATA, Inst. of Phys. Chem. Res., Wako, Saitama 351; S. OBARA, H. KASHIWAGI, K. MOROKUMA, Inst. for Molecular Science, Myodaiji, Okazaki 444; K. NISHIMOTO, Dept. of Chem., Osaka City Univ., Sumiyoshi-ku, Osaka 558; K. TANAKA, Dept. of Chem., Hokkaido Univ., Sapporo 060; and K. OHNO, Dept. of Chem., Hokkaido Univ., Sapporo 060, and Dept. of Chem., Ochanomizu Univ., Bunkyo-ku, Tokyo 112 (Japan)	544
<u>PATTERNS, IMAGES</u>	
Quantification of Patterns and its Application to the Analysis of Variance - M. SATO and A. SHINOZAKI, Department of Applied Chemistry, Gunma University, Kiryu, Gunma 376 (Japan)	548
Linear and Nonlinear Data Reduction of Chemical Data Bases with Underlying Variable Factor Analysis - CLEMENS JOCHUM and BRUCE R. KOWALSKI, Laboratory for Chemometrics, Department of Chemistry BG-10, University of Washington, Seattle, WA 98195 (U.S.A.)	552
Graph-Based Region Analyzer - KASUYA SHIMIZU, TOSIYASU L. KUNII, Department Information Science, Fac. Science, Univ. Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113 (Japan), and NOBUO OHBO, Inst. Information Science and Electronics, Univ. Tsukuba, Ibaragi 305 (Japan)	556
Interactive Graphic Analysis of Three-Dimensional Data - An Experimental System for Applications in R & D - R.R. HARTWIG, IBM Scientific Center, Heidelberg (F.R.G.)	561
Derivability and Comparability Among Non-Atomic Data - HIDETO SATO, Institute of Socio-Economic Planning, The University of Tsukuba, Sakura, Ibaraki 305 (Japan)	565
<u>MISCELLANEOUS TOPICS, INCLUDING LEGAL ASPECTS</u>	
The Numeric Data - Problems of Non Reproducible Data Due to Large Growth Rates - G.K. HARTMANN, Max-Planck-Institut für Aeronomie, D-3411 Katlenburg-Lindau 3, P.O. Box 20 (Federal Republic of Germany)	569
An Approach to Retrieval of Conceptual Contents of Scientific Information - Sentence Retrieval - H. TANAKA, Faculty of Science, Hokkaido Univ., Nishi 8-Chome, Kita 10-Jo, Kita-ku, Sapporo, and M. NIKKUNI, Center for Information Processing Education, Hokkaido Univ., Nishi 5-Chome, Kita 10-Jo, Kita-ku, Sapporo (Japan)	574
The Economics of On-Line Data Dissemination - STEPHEN R. HELLER, US Environmental Protection Agency, MIDSD, PM-218, 401 M. Street, SW, Washington, DC 20460 (U.S.A.)	578
Copyright in Computer Programs And Data Bases - MICHAEL S. KEPLINGER, Chief, Information and Reference Division, United States Copyright Office, Library of Congress, Washington, DC (U.S.A.)	586

Data Needs for Development - JOHN B. ROSE, Division of the General Information Programme, Unesco, Paris (France)	590
On a Tentative Step to Find CODATA Coworkers in a Country - LODOVICA RIVA DI SANSEVERINO, Istituto di Mineralogia e Petrografia, Università di Bologna (Italy)	595
AUTHOR INDEX	598
SUBJECT INDEX	601
LIST OF PARTICIPANTS	607

