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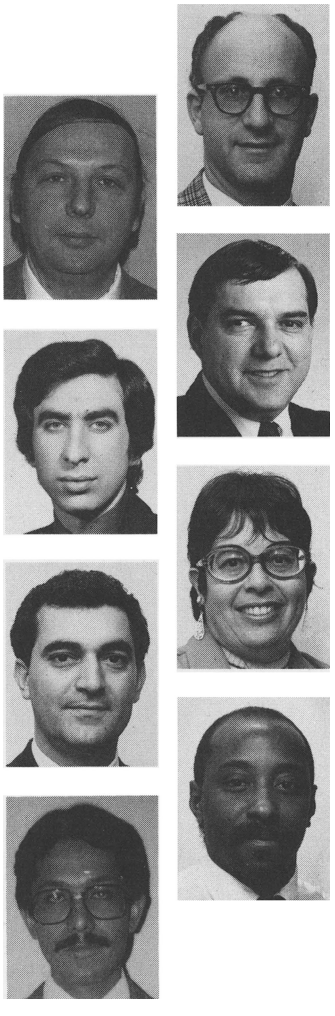
AUTHORS — MAY 1986

PERFORMANCE OF BOROSILICATE GLASS HIGH-LEVEL WASTE FORMS IN DISPOSAL SYSTEMS

MECHANISMS OF DEFENSE WASTE GLASS DISSOLUTION

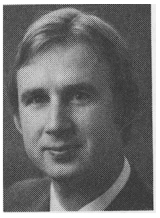
Aaron Barkatt
Barbara C. Gibson
Pedro B. Macedo
Charles J. Montrose
William Sousanpour
Alisa Barkatt
Morad-Ali Boroomand
Victor Rogers
Miguel Penafiel

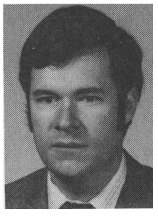


Aaron Barkatt (top right) (PhD, chemistry, The Hebrew University of Jerusalem, 1974) is a research professor at the Vitreous State Laboratory (VSL). He is interested in the surface chemistry of silicate glasses; he has used this to explore the chemical durability of glass and the development of glass optical fiber sensors. **Barbara C. Gibson** (photo unavailable) [BS, chemistry, Catholic University of America (CUA), 1979] is a graduate student in chemistry at CUA; she is carrying out research in silicate glass durability at the VSL. **Pedro B. Macedo** (top left) (PhD, physics, CUA, 1961) is a professor of physics and co-director of the VSL at CUA. His activity has been mainly in the molecular engineering of new glass materials for novel applications. **Charles J. Montrose** (second from top right) (PhD, physics, CUA, 1967) is the chairman of the physics department at CUA. His research ranges from mathematical studies of glass dissolution to molecular dynamics computer simulations of liquids and glasses to study their response to large and suddenly applied external disturbances. **William Sousanpour** (second from top left) (MS, chemistry, CUA, 1980) joined the VSL in 1980 and is doing research in the development of tests and models and analyzing the mechanisms of leaching processes involving nuclear waste form materials. **Alisa Barkatt** (third from top right) joined the VSL of CUA as a research assistant in 1978. **Morad-Ali Boroomand** (third from top left) (BA, chemistry, University of Iran, 1976; BCE, CUA, 1981) joined the VSL as a research technician in 1981. **Victor Rogers** (bottom right) (BA, chemistry, The University of the District of Columbia, 1979; BS, computer science, George Washington University, Washington, D.C., 1980; MBA, George Washington University, Washington, D.C., 1985) joined the VSL of CUA as a research technician in 1980 and is currently doing research in the areas of low-level leach rates. **Miguel Penafiel** (bottom left) (MS, electrical engineering, CUA, 1980) is a research associate at the VSL of CUA. He joined the VSL in 1980 and is currently doing research in the area of optrode development.

RELEASE OF ACTINIDES FROM DEFENSE WASTE GLASS UNDER SIMULATED REPOSITORY CONDITIONS

M. J. Apted
G. L. McVay
J. W. Wald

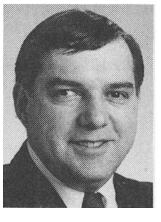




M. J. Apted (top) (BS, chemistry, Massachusetts Institute of Technology, 1974; PhD, geochemistry, University of California, Los Angeles, 1980) is a senior research scientist in the materials department at Pacific Northwest Laboratory (PNL). Among his current interests is the performance assessment of nuclear waste repositories, particularly testing and modeling of radionuclide release rates from nuclear waste forms. **G. L. McVay** (center) (BS, metallurgical engineering, University of Missouri-Rolla, 1965; MS, 1967, and PhD, 1970, ceramic engineering, University of Missouri-Rolla) is a section manager in the materials department at PNL. His current activities include the performance assessment of nuclear waste glasses and ceramics due to interactions with aqueous solutions. **J. W. Wald** (bottom) (BS, materials science, California State University, San Jose, 1972; MS, metallurgical engineering, University of Washington, 1975) is a senior research scientist in the materials department at PNL. He is currently working on the development and characterization of actinide-doped glasses for nuclear waste management research and development.

MODELING OF WASTE FORM PERFORMANCE AND SYSTEM RELEASE

Aaron Barkatt
Pedro B. Macedo
Barbara C. Gibson
Charles J. Montrose



Aaron Barkatt (top) (PhD, chemistry, The Hebrew University of Jerusalem, 1974) is a research professor at the Vitreous State Laboratory (VSL). He is interested in the surface chemistry of silicate glasses; he has used this to explore the chemical durability of glass and the development of glass optical fiber sensors. **Pedro B. Macedo** (center) [PhD, physics, Catholic University of America (CUA), 1961] is a professor of physics and co-director of the VSL at CUA. His activity has been mainly in the molecular engineering of new glass materials for novel applications. **Barbara C. Gibson** (photo unavailable) (BS, chemistry, CUA, 1979) is a graduate student in chemistry at CUA; she is carrying out research in silicate glass durability at the VSL. **Charles J. Montrose** (bottom) (PhD, physics, CUA, 1967) is the chairman of the physics department at CUA. His research ranges from mathematical studies of glass dissolution to molecular dynamics computer simulations of liquids and glasses to study their response to large and suddenly applied external disturbances.

INTERNATIONAL COLLABORATION IN NUCLEAR WASTE SOLIDIFICATION

Larry L. Hench

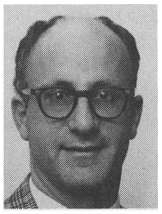
Larry L. Hench is a professor of materials science and engineering at the University of Florida and serves as the director of the Bioglass Research Center and the Materials Center of Excellence in Engineering.

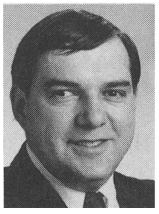
LONG-TERM RELEASE RATES OF BOROSILICATE GLASS WASTE FORMS

Pedro B. Macedo
Aaron Barkatt
Barbara C. Gibson
Charles J. Montrose

Pedro B. Macedo (right) [PhD, physics, Catholic University of America (CUA), 1961] is a professor of physics and co-director of the Vitreous State Laboratory (VSL) at CUA. His activity has been mainly in the molecular engineering of new glass materials

for novel applications. **Aaron Barkatt** (top) (PhD, chemistry, The Hebrew University of Jerusalem, 1974) is a research professor at the VSL. He is interested in the surface chemistry of silicate glasses; he has used this to explore the chemical durability of glass and the development of glass optical fiber sensors. **Barbara C. Gibson** (photo unavailable) (BS, chemistry, CUA, 1979) is a graduate student in chemistry at CUA; she is carrying out research in silicate glass durability at the VSL. **Charles J. Montrose** (bottom) (PhD, physics, CUA, 1967) is the chairman of the physics department at CUA. His research ranges from mathematical studies of glass dissolution to molecular dynamics computer simulations of liquids and glasses to study their response to large and suddenly applied external disturbances.





FISSION REACTORS

ANALYSIS OF HIGH CONVERTOR PRESSURE TUBE REACTORS

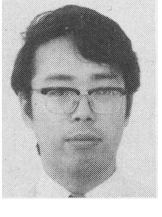
Yigal Ronen
Yaakov Fahima

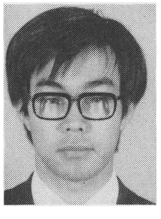
Yigal Ronen (top) (BS, mechanical engineering, and MS, nuclear engineering, Technion-Israel Institute of Technology, 1967; PhD, nuclear engineering, Cornell University, 1970) is professor of nuclear engineering at Ben-Gurion University. His research interests include advanced concepts of nuclear reactors and problems in uncertainty analysis. He is currently president of the Israel Nuclear Society. **Yaakov Fahima** (BSc, chemical engineering, 1977, and MSc, nuclear engineering, 1980, Ben-Gurion University of the Negev, Israel) is currently a doctoral student in the Department of Nuclear Engineering at Ben-Gurion University. His current research is on bias operator methods and advanced tight lattice reactors.

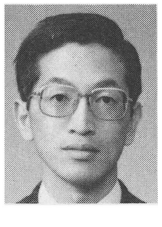
RADIOACTIVE WASTE MANAGEMENT

REUSE SYSTEM FOR POWDERED ION-EXCHANGE RESINS

Kiyomi Funabashi
Tetsuo Fukasawa
Fumio Kawamura
Hideo Yusa
Makoto Kikuchi
Noriharu Sasaki
Toshio Yamadera





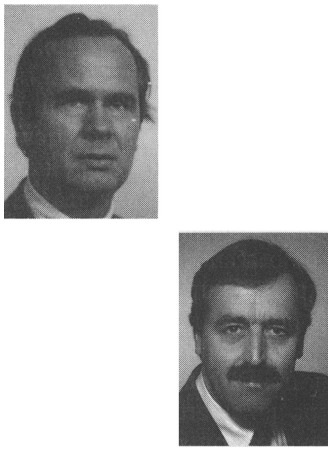


Kiyomi Funabashi (top right) (Hitachi Technical College, Japan, 1974) has been a research scientist at Energy Research Laboratory (ERL), Hitachi, Ltd., since 1971. He has specialized in adsorption chemistry and developed various adsorbents, including iodine adsorbent, which is used in boiling water reactor plants. He is currently working in the field of radioactive waste treatment. **Tetsuo Fukasawa** (top left) (BS, 1976; MS, 1978; and Dr. Eng., 1981, nuclear engineering, Tohoku University, Japan) is a researcher at ERL. His primary areas of interest are the radiochemistry of actinide elements and the chemical process of spent fuel reprocessing. **Fumio Kawamura** (bottom right) (BS, chemical engineering, Gunma University, Japan, 1970; MS, 1972, and Dr. Eng., 1976, Tohoku University, Japan) is a senior researcher at ERL where he is involved in radioactive waste management and reactor water chemistry. **Hideo Yusa** (bottom left) (BS, physics, Tohoku University, Japan, 1959; Dr. Eng., Osaka

University, Japan, 1969) is a chief researcher at ERL. He is responsible for research and development (R&D) of radioactive waste management systems. **Makoto Kikuchi** (top) (BS, chemistry, Tohoku University, Japan, 1968; PhD, chemistry, University of New York at Buffalo, 1973) is a senior engineer at Hitachi Works, Hitachi, Ltd., and responsible for R&D of radioactive waste systems. **Noriharu Sasaki** (center) (BS, chemistry, Aoyama Gakuin University, Japan, 1972) is a researcher at the Matsudo Laboratory of the Hitachi Plant Engineering and Construction Company, Ltd. (HPC). His interests and activities are in electrochemistry. Currently, he is working on the development of etching for print circuit boards. **Toshio Yamadera** (bottom) (BS, industrial chemistry, Yamagata University, Japan, 1962) is a department manager at the Matsudo Laboratory of HPC and is responsible for R&D of radioactive waste management systems.

FUEL REPROCESSING VERSUS DIRECT DISPOSAL OF SPENT FUEL—A COMPARISON FROM THE STANDPOINT OF RADIOLOGICAL SAFETY

Reiner Papp
Herbert Loser

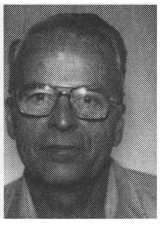


Reiner Papp (top) (PhD, technical physics, Technical University of Vienna, Austria, 1971) joined the Institute for Applied Reactor Physics and Systems Analysis at Karlsruhe Nuclear Research Center (KfK) in 1971. Since 1981, he has been a member of KfK's "Alternative Entsorgung" project management, responsible for systems analysis of postirradiation fuel cycle alternatives. Between 1977 and 1980, he was a visiting professor in the nuclear engineering department at the University of Arizona. **Herbert Loser** (MS, mechanical engineering, Technical University of Graz, Austria, 1970) worked at Allgemeine Elektricitäts Gesellschaft and Kraftwerk Union AG in Frankfurt where he dealt with safety analyses of boiling water reactors within the framework of the Federal Republic of Germany's emergency core cooling program. He joined Dornier System in 1975 where he got involved in probabilistic safety analysis of the nuclear fuel cycle. From 1981 to 1985 he was delegated to KfK's Projektgruppe Andere Entsorgungstechniken.

MATERIALS

ANALYSIS OF GRAPHITE-HYDROGEN-METHANE KINETICS ABOVE 1600 K

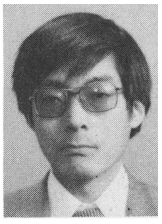
John D. Rogers
Alexander Sesonske



John D. Rogers (top) (PhD, Ohio State University, 1950) is an engineer at the Los Alamos National Laboratory (LANL). He has worked on the relative performance of ram jets, microwave spectroscopy, paramagnetic and nuclear magnetic resonance, cryogenic engineering, two-phase flow, nuclear rocket propulsion, and applied superconductivity. He is presently working in the fields of superconducting magnetic energy storage and fusion engineering in the Controlled Thermonuclear Research Division at LANL. **Alexander Sesonske** (PhD, University of Delaware, 1950) is professor of nuclear engineering at Purdue University. His broad interests lie in various nuclear reactor engineering areas, including system design, core management, fuels, thermal hydraulics, and safety.

APPLICATION OF THE VORTEX METHOD TO ANALYSIS OF COOLANT TEMPERATURE FLUCTUATION

Ken Amano
Masayoshi Ishida



Ken Amano (top) (BE, electrical engineering, Yokohama National University, Japan, 1979; MS, plasma physics, Tokyo Institute of Technology, Japan, 1981) has been engaged in research on statistical mechanics of liquid metal in the fast breeder reactor core system unit at the Energy Research Laboratory (ERL), Hitachi, Ltd., Japan. **Masayoshi Ishida** (MS, physics, Tokyo Institute of Technology, 1969) is a senior researcher at ERL, Hitachi, Ltd., where his work has been in the development of fuel behavior models for both light water reactor and liquid-metal fast breeder reactor fuels.