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VITA

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**Education:**

Bronx High School of Science, 1960  
University of Chicago, 1963 (B.S.)  
University of Chicago, 1964 (M.S.)  
University of Chicago, 1967 (Ph.D.)

Area of Specialization: Solid State Chemistry, Ceramics, Physics and Chemistry of Minerals,  
Geochemistry

**Professional Experience:**

1967 – 1968      Research Associate, Technische Hochschule, Clausthal, Germany, Institut für  
Theoretische Huttenkunde

1968 – 1969      Research Associate, Pennsylvania State University Dept. of Mineralogy and  
Geochemistry

1969 – 1974      Assistant Professor, Arizona State University Dept. of Chemistry

1970 – 1971      Visiting Research Associate, University of Chicago, James Franck Institute

1972              Visiting Scientist, Technische Universität, Clausthal, Germany

1974 – 1978      Associate Professor, Arizona State University Dept. of Chemistry

1974              Visiting Scientist, Bell Telephone Laboratories

1975              Visiting Lecturer, Massachusetts Institute of Technology

1976              Visiting Associate Professor, University of California at Berkeley

1976 – 1977      Program Director for Chemical Thermodynamics, National Science Foundation

1978 – 1985      Professor, Arizona State University, Depts. of Chemistry and Geology

1981              Visiting Professor, State University of New York at Stony Brook

1984 – 1985      Director, Center for Solid State Science, Arizona State University

1985 – 1997      Professor, Princeton University, Dept. of Geological and Geophysical Sciences,  
Affiliate faculty, Dept. of Chemistry, Member, Princeton Materials Institute

1988 – 1991      Chairman, Dept. of Geological and Geophysical Sciences, Princeton University

1988              Visiting Summer Faculty, I.B.M., T.J. Watson Research Center

1992 – 1997      Albert G. Blanke, Jr. Professor of Geological and Geophysical Sciences,  
Princeton University

- 1997 – present     Interdisciplinary Professor of Ceramic, Earth, and Environmental Materials Chemistry, University of California at Davis. Appointments in Departments of Chemical Engineering and Materials Science (home department); Chemistry; Land, Air and Water Resources; Geology
- 2001 – present     Edward Roessler Chair in Mathematical and Physical Sciences, University of California at Davis
- 2002 – present     Director of the NEAT ORU, Edward Roessler Chair in Mathematical and Physical Sciences, Interdisciplinary Professor of Ceramic, Earth, and Environmental Materials Chemistry
- 2003 – present     Granted Honorary Title of Distinguished Professor, University of California at Davis

### Professional Organizations and Honorary Societies:

Phi Beta Kappa  
 Sigma Xi  
 American Ceramic Society  
 American Chemical Society  
 American Geophysical Union  
 Mineralogical Society of America  
 Materials Research Society  
 Geochemical Society

### Honors and Awards:

- 1973 – 1975     Alfred P. Sloan Fellowship
- 1981             Mineralogical Society of America Award, Fellow
- 1982 – 1983     Arizona State University, Graduate College Distinguished Research Award
- 1988             American Geophysical Union, Fellow
- 1991 – 1992     Mineralogical Society of America, Vice President
- 1992 – 1993     Mineralogical Society of America, President
- 1993             Elected to National Academy of Sciences
- 1995             Ross Coffin Purdy Award of the American Ceramic Society, in recognition of the most valuable contribution to ceramic technical literature, 1993
- 1995             Doctor Honoris Causa, Uppsala University, Sweden
- 1997             Geochemical Society, Fellow
- 1999             Kreeger-Wolf Visiting Scholar, Northwestern University
- 2000             Alexander M. Cruickshank Award, Gordon Conference
- 2000             Hugh M. Huffman Memorial Award, The Calorimetry Conference
- 2000             Ceramic Educational Council Outstanding Educator Award
- 2001             American Ceramic Society, Fellow
- 2001             American Ceramic Society, Best Paper Award of the Nuclear and Environmental Technology Division
- 2002             Benjamin Franklin Medal in Earth Science
- 2002             Highly Cited Researchers Award, ISI Thomson Scientific
- 2002             Fellow, Mineralogical Society (Great Britain)
- 2002             Urey Medal of the European Association of Geochemistry
- 2005             Spriggs Phase Equilibria Award of the American Ceramic Society
- 2006             Rossini Lectureship Award, 19th International Conference on Chemical Thermodynamics, Boulder, Colorado
- 2006             Harry H. Hess Medal of the American Geophysical Union
- 2007             Sloan Faculty Distinguished Service Award - University of California at Davis
- 2007             Outstanding Engineering Senior Career Research Award – University of California at Davis
- 2008             Appointed Honorary Professor at School of Environmental Sciences and Urban Studies, Shenzhen Graduate School, University of Peking, China

2009 Roebling Medal of Mineralogical Society of America  
2009 Best University Paper Award, DOE Geoscience Grantee Meeting

**Service:**

1976 – 1985 Physics and Chemistry of Minerals, Advisory Board  
1985 – 1991 North American Editor, Physics and Chemistry of Minerals  
1980 – 1987 Calphad Journal, Advisory Board  
1981 – 1983 American Mineralogist, Associate Editor  
1981 – present Advances in Physical Geochemistry, Advisory Board  
1985 – present Progress in Solid State Chemistry, Editorial Advisory Board  
1977 – 1979 NASA: Subcommittee on Materials Processing in Space  
1979 – 1981 NSF: Advisory Committee, Division of Materials Research  
1980 Co-organizer, Conference on Structural Chemistry of Complex Solids, Castle Hot Springs, Arizona  
1981 National Science Foundation, Chair, Ad Hoc Oversight Review of Solid State Chemistry Program  
1981 – 1985 National Academy of Sciences, Committee on High Temperature Chemistry  
1982 Co-organizer (with P. Day) of U.S.-U.K. Workshop on Solid State Chemistry, Oxford, England  
1982 – 1985 Councilor, Mineralogical Society of America  
1983 – 1993 American Geophysical Union, Committee on Mineral Physics  
1983 National Science Foundation, Panel on Visiting Professorship for Women  
1983 – 1985 Mineralogical Society of America, Chair of 1984 MSA Award Committee, Chair of 1985 Mineralogy-Petrology Grant Committee  
1984 National Science Foundation, Workshop on Materials Chemistry  
1985 Co-organizer (with S. W. Kieffer) of Mineralogical Society of America Short Course, "Microscopic to Macroscopic - from Atomic Environments to Thermodynamic Properties", May 1985, Chestertown, MD  
1986 – 1989 Stanford University, Earth Sciences Advisory Board  
1986 – present Series Editor, Oxford Monographs on Geology and Geophysics  
1987 Convener, American Geophysical Union Chapman Conference on "Perovskite - A Structure of Great Interest to Geophysics and Materials Science", Bisbee AZ, October 1987  
1988 Geophysical Laboratory, Carnegie Institution of Washington, Advisory Committee  
1988 Local Organizing Committee, 11th International Symposium on the Reactivity of Solids, Princeton, NJ, June 1988

1989 – 1992 National Science Foundation, Advisory Committee on Earth Sciences

1990 – 1993 MIT Earth Sciences Advisory Committee

1990 National Science Foundation, Earth Sciences, Committee of Visitors, Geochemistry Program, Chair

1990 American Geophysical Union Fall Meeting, Symposium Convener "Mineral Physics of Materials, Near the Earth's Surface"

1991 – 1994 Harvard University, Department of Earth and Planetary Sciences, Visiting Committee

1991 National Science Foundation, Earth Sciences Committee of Visitors, Instrumentation, Chair

1991 California Institute of Technology, Division of Geological Sciences, Visiting Committee

1992 Columbia University, Geological Sciences, Visiting Committee

1992 Spring American Geophysical Union Meeting, Symposium Co- Convener, "What Do We Really Know About the Mantle?"

1993 – 1994 Department of Energy Basic Energy Sciences Advisory Committee (BESAC)

1993 – 1996 American Geophysical Union, Bowie Medal Committee, Chair, 1996

1994 Convener, CSEDI Workshop on Mantle Models, North East, Maryland, May 1994

1995 Mineralogical Society of America, Roebling Medal Committee

1995 – 1997 NRC Board on Earth Sciences and Resources

1995 Organizer, Symposium on Mineral Thermodynamics, Goldschmidt Conference, State College, PA, May 1995

1995 – 1997 National Science Foundation, Geochemistry Panel

1996 National Science Foundation, MRSEC Panel

1996 – 1997 Review Committee for Institute of Geophysics and Planetary Physics (IGPP), University of California

1996 – 1997 Natural Materials Advisory Board Committee on Advanced Fibers for High Temperature Ceramic Applications

1996 – 1998 Organizing Committee, 12th International Zeolites Congress, Baltimore, MD, July 1998

1997 National Science Foundation, Earth Sciences Advisory Committee

1997 National Science Foundation, Earth Sciences Committee of Visitors, Instrumentation and Facilities Program, Chair

1998 – 2000 Journal of Materials Research, Principal Editor

1998 Arizona State University, MRSEC Advisory Committee

1998 Geochemical Society, Board of Directors

1999 – present	Los Alamos National Laboratory, Earth and Environmental Science Divisional Review Committee
1999 – present	Sandia National Laboratory, Geoscience Advisory Committee
1999	Workshop on Mineral and Rock Physics, Organizer, Scottsdale, AZ, May 28-30, 1999
2000 – 2001	13th International Zeolite Conference, International Advisory Board, Montpellier, France
2000 – 2001	BES (Basic Energy Sciences), Council on Chemical Sciences
2001 – present	Los Alamos National Laboratory, Nuclear Materials Technology Division, Divisional Review Committee
2001	Los Alamos National Laboratory, Search Committee for Director of Institute of Geophysics and Planetary Physics
2001	Co-organizer, Mineralogical Society of America Short Course on Nanoparticles in the Environment
2002	Co-organizer, NSF/DOE Workshop on Nanogeoscience
2003	Participant and Group Leader, USDA Workshop on Defining Agriculture Opportunities in Nanotechnology
2002	Co- Convener, Materials Research Society Symposium on Perovskites
2002 – 2004	NRC Committee on Advanced Geochemical Methods for Managing Carbon
2002 – 2004	Science, Board of Reviewing Editors
2002 – 2003	Geochemical Society F.W. Clarke Award Committee
2003 – 2005	Chemistry of Materials Editorial Advisory Board
2003 – 2004	Member, Nanotechnology Technical Advisory Group (TAG) for President's Council of Advisors on Science and Technology (PCAST)
2003 – 2006	Advisory Board, Environmental Molecular Science Institute, Notre Dame University
2005	Organizing Committee: International Conference on Perovskites – Properties and Applications
2006	Science and Technology Committee, Los Alamos National Laboratory
2006	Phase Equilibria Program and Spriggs Phase Equilibria Award Subcommittees, The American Ceramic Society
2006 – 2008	Honors and Recognition Committee, American Geophysical Union
2006	Finance Committee, Mineralogical Society of America
2006	Geo2000 – Geosciences Futures Committee, National Science Foundation
2007	External Advisory Board, Delaware EPSCoR Research Infrastructure Improvement Program and The Center for Critical Zone Research

- 2007                    Advisory Board Member of the 15th International Zeolite Conference, Beijing, China (15th IZC)
- 2007                    Local Organizing Committee, XVIth International Symposium on the Reactivity of Solids, University of Minnesota
- 2004                    99<sup>th</sup> Bunsen-Kolloquium Kloster Eberbach, Germany
- 2007                    DOE BES Contractor's Meeting, Hunt Valley, Maryland
- 2007                    Ceramics, Composites & Powders Panel, Arlington, Virginia
- 2007                    NSF Site Visit Review of IMI, Santa Barbara, California

**Major Invited Lectures:**

- 1985                    Mineralogical Society of America, Short Course on Microscopic to Macroscopic
- 1986                    Hoots Lecture, Stanford University
- 1986                    Mineralogical Society of America, Short Course on Silicate Melts
- 1987                    Mineralogical Society of America, Short Course on Thermodynamic Modeling
- 1992                    Gordon Conference on Molten Metals and Melts
- 1992                    Japan Conference on Calorimetry and Thermal Analysis
- 1994                    Nordic Calorimetry and Thermal Analysis Society
- 1995                    Gordon Conference on Solid State Chemistry
- 1995                    Gordon Conference on Zeolites
- 1995                    Eyring Lectures, Arizona State University
- 1995                    Mineralogical Society of America, Short Course on Silicate Melts
- 1996                    NATO Advanced Study Institute on Actinides and the Environment
- 1996                    50 Years of Materials Science at University of Pennsylvania Symposium
- 1996                    Gordon Conference on High Temperature Chemistry
- 1997                    Gordon Conference on Liquids
- 1998                    Gordon Conference on Disordered Materials
- 1999                    Kreeger-Wolf Lecture at Northwestern University
- 2001                    Alexander M. Cruickshank Lecturer, Conference on High Temperature Materials
- 2002                    Mineralogical Society of America Short Course on Nanoparticles in the Environment
- 2002                    Franklin Institute Materials Science Symposium on Materials and Nanotechnology

- 2003 Elizabeth C. Crosby Lecture Series, Materials Science and Engineering, University of Michigan
- 2004 Gordon Conference on Solid State Chemistry II
- 2003 Miami University Nanotechnology Symposium
- 2005 ECI: Alternative Nuclear Waste Forms
- 2004 Hassel Lecture, Norwegian Chemical Society
- 2004 Gordon Conference on High Temperature Materials
- 2004 Gordon Conference on Ceramics
- 2004 University of Minnesota, Women in Science Lectures
- 2006 International Conference on Solid State Ionics
- 2005 Goldschmidt Conference on Geochemistry, Urey Lecture
- 2005 Wohl Lecture Invitation Seminar Speaker, the University of Delaware
- 2006 James Franck Institute Colloquium Invited Speaker, University of Chicago
- 2007 19th International Conference on Chemical Thermodynamics (ICCT-19), Rossini Award Lecture
- 2006 8<sup>th</sup> International Symposium on Crystallization in Glasses and Liquids, Jackson Hole, Wyoming
- 2006 Symposium on High Temperature Corrosion and Materials Chemistry, Cancun, Mexico
- 2007 "Thermodynamic Studies of Environmentally Important Materials: Iron Oxides and Uranium Minerals", University of Delaware
- 2007 "The Nuclear Fuel Cycle: Fundamental Thermodynamic and Solid State Chemical Questions after Sixty Years", The Leroy Eyring Center for Solid State Science, Arizona State University
- 2007 "Thermochemistry of Nanomaterials", Materials Engineering, Centro Universitario da FEI, Sao Paulo, Brazil
- 2007 "Thermodynamics for a Small Planet", The Geological Society of America Annual Meeting, Denver, Colorado
- 2007 "Why I Count Calories for a Living", University of Austin
- 2008 Plenary Lecture: "Energetics of Oxide Nanoparticles", The 5<sup>th</sup> International Workshop on DV-X $\alpha$ : The Advanced Related Experiments and Theories on Materials Science and X-ray Spectroscopy & the 21<sup>st</sup> Annual Meeting of the Society for DV-X $\alpha$  Japan, Himeji, Japan.
- 2008 "Environment, Energy, Nanoscience", Environmental Sciences in the 21<sup>st</sup> Century, Peking University, Beijing, China
- 2008 Electroceramics Symposium Speaker at the VII Brazilian MRS Meeting

**Patents:**

“Removal of Organic Structure Directing Agents from Inorganic Nano-Composite Materials”, A. Navrotsky, A. N. Parikh, U.S. Pat. Appl. Publ., 17pp. (2004).

U. S. Patent No. 6,960,327 (Issued: November 1, 2005)

“Methods for Removing Organic Compounds from Nano-Compositic Materials” (UC Case No. 2003-121-1)

U. S. Patent No. 7,141,857 (Issued: November 28, 2006)

“Semiconductor Structures and Methods of Fabricating Semiconductor Structures Comprising Hafnium Oxide Modified with Lanthanum, a Lanthanide-Series Metal, or a Combination Thereof”

## ALEXANDRA NAVROTSKY

### PUBLICATIONS - RESEARCH PAPERS

- "Enthalpies of Mixing in Silver Bromide-Alkali Bromide and Thallium Chloride-Alkali Chloride Liquid Mixtures", L. S. Hersh, A. Navrotsky, and O. J. Kleppa, *J. Chem. Phys.* 42, 3752-3757 (1965).
- "High-Temperature Calorimetry in Liquid Oxide Systems. III. The Enthalpy of Formation of Magnesium-Aluminum Spinel", A. Navrotsky and O. J. Kleppa, *Inorg. Chem.* 5, 192-193 (1966).
- "A Calorimetric Study of Molten Na<sub>2</sub>MoO<sub>4</sub>-MoO<sub>3</sub> Mixtures at 970 K", A. Navrotsky and O. J. Kleppa, *Inorg. Chem.* 6, 2119-2121 (1967).
- "Enthalpy of Transformation of a High-Pressure Polymorph of Titanium Dioxide to the Rutile Modification", A. Navrotsky, J. C. Jamieson, and O. J. Kleppa, *Science* 158, 388-389 (1967).
- "Enthalpy of the Anatase-Rutile Transformation", A. Navrotsky and O. J. Kleppa, *J. Am. Ceram. Soc.* 50, 626 (1967).
- "The Thermodynamics of Cation Distributions in Simple Spinel", A. Navrotsky and O. J. Kleppa, *J. Inorg. Nucl. Chem.* 29, 2701-2714 (1967).
- "Thermodynamics of Formation of Simple Spinel", A. Navrotsky and O. J. Kleppa, *J. Inorg. Nucl. Chem.* 30, 479-498 (1968).
- "Thermodynamics of A<sub>3</sub>O<sub>4</sub>-B<sub>3</sub>O<sub>4</sub> Spinel Solid Solutions", A. Navrotsky, *J. Inorg. Nucl. Chem.* 31, 59-72 (1969).
- "Enthalpies of Formation of Some Tungstates MWO<sub>4</sub>", A. Navrotsky and O. J. Kleppa, *Inorg. Chem.* 8, 756-758 (1969).
- "Phase Equilibria and Thermodynamic Properties of Solid Solutions in the Systems ZnO-CoO-TiO<sub>2</sub> and ZnO-NiO-TiO<sub>2</sub> at 1050 °C", A. Navrotsky and A. Muan, *J. Inorg. Nucl. Chem.* 32, 3471-3484 (1970).
- "Synthesis of Mg<sub>2</sub>GeO<sub>4</sub>" from Tetraethylorthogermanate", A. Navrotsky, *J. Am. Ceram. Soc.* 53, 696 (1970).
- "Activity-Composition Relations in the Systems CoO-ZnO and NiO-ZnO at 1050°C", A. Navrotsky and A. Muan, *J. Inorg. Nucl. Chem.* 33, 35-47 (1971).
- "The Intracrystalline Cation Distribution and the Thermodynamics of Solid Solution Formation in the System FeSiO<sub>3</sub>-MgSiO<sub>3</sub>", A. Navrotsky, *Amer. Miner.* 56, 201-211 (1971).
- "Enthalpies of Transformation Among the Tetragonal, Hexagonal and Glassy Modifications of GeO<sub>2</sub>", A. Navrotsky, *J. Inorg. Nucl. Chem.* 33, 1119-1124 (1971).
- "The Enthalpy of the Ilmenite-Perovskite Transformation in Cadmium Titanate", J. M. Neil, A. Navrotsky, and O. J. Kleppa, *Inorg. Chem.* 10, 2076-2077 (1971).
- "Synthesis of Uvarovite Using a Sodium-Potassium-Borate Flux", J. Lowell, A. Navrotsky, and J. R. Holloway, *J. Am. Ceram. Soc.* 54, 466 (1971).
- "Thermodynamics of Formation of the Silicates and Germanates of Some Divalent Transition Metals and of Magnesium", A. Navrotsky, *J. Inorg. Nucl. Chem.* 33, 4035-4050 (1971).
- "Approximate Activity-Composition Relations in the System MgO-ZnO at 1205 ± 5 °C", D. S. Kenny and A. Navrotsky, *J. Inorg. Nucl. Chem.* 34, 2115-2119 (1972).

"Thermodynamic Relations Among Olivine, Spinel and Phenacite Structures in Silicates and Germanates: I. Volume Relations and the Systems NiO-MgO-GeO<sub>2</sub> and CoO-MgO-GeO<sub>2</sub>", A. Navrotsky, *J. Solid State Chem.* 6, 21-41 (1973).

"Thermodynamic Relations Among Olivine, Spinel and Phenacite Structures in Silicates and Germanates: II. The Systems NiO-ZnO-GeO<sub>2</sub> and CoO-ZnO-GeO<sub>2</sub>", A. Navrotsky, *J. Solid State Chem.* 6, 42-47 (1973).

"Discussion of 'Equilibrium Cation Distributions in NiAl<sub>2</sub>O<sub>4</sub>, CuAl<sub>2</sub>O<sub>4</sub>, and ZnAl<sub>2</sub>O<sub>4</sub>'", A. Navrotsky, *J. Am. Ceram. Soc.* 56(2), 106 (1973).

"Estimate of Enthalpies of Formation and Fusion of Cordierite", A. Navrotsky and O. J. Kleppa, *J. Amer. Ceram. Soc.* 56(4), 198-199 (1973).

"Ni<sub>2</sub>SiO<sub>4</sub> - Enthalpy of the Olivine-Spinel Transition by Solution Calorimetry at 713 °", A. Navrotsky, *Earth Planet. Sci. Lett.* 19, 471-475 (1973).

"Sillimanite -- Disordering Enthalpy by Calorimetry", A. Navrotsky, R. C. Newton, and O. J. Kleppa, *Geochim. Cosmochim. Acta* 37, 2497-2508 (1973).

"Enthalpy of the Olivine-Spinel Transition in Magnesium Orthogermanate and the Thermodynamics of Olivine-Spinel-Phenacite Stability Relations", A. Navrotsky, in "Phase Transition-1973, Proceedings of the Conference on Phase Transitions and their Applications in Materials Science, University Park, Pa., May 23-25, 1973", L. E. Cross, Ed., Pergamon Press, 393-398 (1973).

"Thermodynamic Relations Among Olivine, Spinel and Phenacite Structures in Silicates and Germanates: III. The System CuO-MgO-GeO<sub>2</sub>", A. Navrotsky, *J. Solid State Chem.* 11, 10-16 (1974).

"Thermodynamic Relations Among Olivine, Spinel and Phenacite Structures in Silicates and Germanates: IV. The System ZnO-MgO-GeO<sub>2</sub>", A. Navrotsky, *J. Solid State Chem.* 12, 12-15 (1975).

"Stability of Two Cobalt Titanate Defect Spinel", J. P. Sharples and A. Navrotsky, *J. Solid State Chem.* 12, 122-126 (1975).

"Thermodynamics of Formation of Some Compounds with the Pseudobrookite Structure and of the FeTi<sub>2</sub>O<sub>5</sub>-Ti<sub>3</sub>O<sub>5</sub> Solid Solution Series", A. Navrotsky, *Amer. Miner.* 60, 249-256 (1975).

"Ionicity and Phase Transitions at Negative Pressures", A. Navrotsky and J. C. Phillips, *Phys. Rev. B*, 11, 1583-1586 (1975).

"Thermochemistry of Chromium Compounds, Especially Oxides at High Temperature", A. Navrotsky, *Geochim. Cosmochim. Acta*, 39(6-7), 819-832 (1975).

"Thermodynamic Relations Among Olivine, Spinel and Phenacite Structures in Silicates and Germanates: V. The System MgO-'FeO'-GeO<sub>2</sub>", A. Navrotsky and L. Hughes, Jr., *J. Solid State Chem.* 16, 185-188 (1976).

"High Temperature Heat Content and Diffuse Transition in Lead Fluoride", C. E. Derrington, A. Navrotsky, and M. O'Keefe, *Solid State Comm.* 18, 47-49 (1976).

"Co<sup>2+</sup> as a Chemical Analogue for Fe<sup>2+</sup> in High Temperature Experiments in Basaltic Systems", W. E. Coons, J. R. Holloway, and A. Navrotsky, *Earth Planet. Sci. Lett.* 30, 303-308 (1976).

"Spinel Disproportionation at High Pressure: Calorimetric Determination of Enthalpy of Formation of Mg<sub>2</sub>SnO<sub>4</sub> and Co<sub>2</sub>SnO<sub>4</sub> and Some Implications for Silicates", A. Navrotsky and R. B. Kasper, *Earth Planet. Sci. Lett.* 31, 247-254 (1976).

"Thermochemistry of Some Pyroxenes and Related Compounds", A. Navrotsky and W. E. Coons, *Geochim. Cosmochim. Acta* 40, 1281-1288 (1976).

- "Calculation of Effect of Cation Disorder on Silicate Spinel Phase Boundaries", A. Navrotsky, *Earth Planet. Sci. Lett.* 33, 437-442 (1977).
- "Calculation of Subsolidus Phase Relations in Carbonates and Pyroxenes", A. Navrotsky and D. Loucks, *Phys. Chem. Min.* 1, 109-127 (1977).
- "Refinement of the Crystal Structure of Mg<sub>2</sub>GeO<sub>4</sub> Spinel", R. B. Von Dreele, A. Navrotsky, and A. L. Bowman, *Acta Cryst.* B33, 2287-2288 (1977).
- "Chemical Thermodynamics - Areas of Current Interest", A. Navrotsky, *Bull. Chem. Thermodyn.* 20, 573-576 (1977).
- "Thermodynamics of Element Partitioning: (1) Systematics of Transition Metals in Crystalline and Molten Silicates and (2) Defect Chemistry and the Henry's Law Problem", A. Navrotsky, *Geochim. Cosmochim. Acta* 42, 887-902 (1978).
- "Experimental Study of the Electronic and Lattice Contribution to the VO<sub>2</sub> Transition", F. Pintchovski, W. S. Glusinger, and A. Navrotsky, *J. Phys. Chem. Solids* 39, 941-949 (1978).
- "Direct Calorimetric Measurement of Enthalpies of Aqueous Sodium Chloride Solutions at High Temperatures and Pressures", R. B. Kasper, J. R. Holloway, and A. Navrotsky, *J. Chem. Thermodyn.* 11, 13-24 (1979).
- "Calorimetric Study of the Stability of High Pressure Phases in the Systems CoO-SiO<sub>2</sub> and "FeO"-SiO<sub>2</sub> and Calculation of Phase Diagrams in MO-SiO<sub>2</sub> Systems", A. Navrotsky, F. S. Pintchovski, and S. Akimoto, *Phys. Earth Planet. Interiors* 19, 275-292 (1979).
- "Thermodynamic Parameters of CaMgSi<sub>2</sub>O<sub>6</sub>-Mg<sub>2</sub>Si<sub>2</sub>O<sub>6</sub> Pyroxenes Based on Regular Solution and Cooperative Disorder Models", T. J. B. Holland, A. Navrotsky, and R. C. Newton, *Contrib. Mineral. Petrol.* 69, 337-344 (1979).
- "The Igneous System CaMgSi<sub>2</sub>O<sub>6</sub>-CaAl<sub>2</sub>Si<sub>2</sub>O<sub>8</sub>-NaAlSi<sub>3</sub>O<sub>8</sub>: Variations on a Classic Theme by Bowen", D. F. Weill, R. Hon, and A. Navrotsky, in "Physics of Magmatic Processes", R. B. Hargraves, Ed., Princeton Univ. Press, 49-92 (1980).
- "Thermodynamic Parameters of CaMgSi<sub>2</sub>O<sub>6</sub>-Mg<sub>2</sub>Si<sub>2</sub>O<sub>6</sub> Pyroxenes Based on Regular Solution and Cooperative Disorder Models, Reply to Discussion", T. J. B. Holland, A. Navrotsky, and R. C. Newton, *Contrib. Mineral. Petrol.* 75, 305-306 (1980).
- "Thermochemistry of Glasses and Liquids in the Systems CaMgSi<sub>2</sub>O<sub>6</sub>-CaAl<sub>2</sub>Si<sub>2</sub>O<sub>8</sub>-NaAlSi<sub>3</sub>O<sub>8</sub>, SiO<sub>2</sub>-CaAl<sub>2</sub>Si<sub>2</sub>O<sub>8</sub>-NaAlSi<sub>3</sub>O<sub>8</sub>, and SiO<sub>2</sub>-Al<sub>2</sub>O<sub>3</sub>-CaO-Na<sub>2</sub>O", A. Navrotsky, R. Hon, D. F. Weill, and D. J. Henry, *Geochim. Cosmochim. Acta* 44, 1409-1423 (1980).
- "Lower Mantle Phase Transitions May Generally Have Negative Pressure - Temperature Slopes", A. Navrotsky, *Geophys. Res. Lett.* 7, 709-711 (1980).
- "Lattice Stabilities of AX and AB<sub>2</sub>O<sub>4</sub> Compounds", A. Navrotsky, *Calphad* 4, 255-264 (1980).
- "Thermodynamics of Solid Solution Formation in NiO-MgO and NiO-ZnO", P.K. Davies and A. Navrotsky, *J. Solid State Chem.* 38, 264-276 (1980).
- "A Thermochemical Calculation of the Pyroxene Saturation Surface in the System Diopside-Albite-Anorthite", R. Hon, D. J. Henry, A. Navrotsky, and D. F. Weill, *Geochim. Cosmochim. Acta* 45, 157-161 (1981).
- "A Thermochemical Study of the Phase Reaction  $(1/7)Pr_7O_{12} + (1/7 - x/2)O_2 = PrO_{2-x}$ ", H. Inaba, A. Navrotsky, and L. Eyring, *J. Solid State Chem.* 37, 67-76 (1981)

- "A Thermochemical Study of the Phase Reaction  $TbO_{1.5+x} + (3/28 - x/2)O_2 \rightleftharpoons (1/7)Tb_7O_{12}$ ", H. Inaba, A. Navrotsky, and L. Eyring, *J. Solid State Chem.* 37, 77-84 (1981).
- "Cesium Chloride Versus Nickel Arsenide as Possible Structures for (Me,Fe)O in the Lower Mantle", A. Navrotsky and P. K. Davies, *J. Geophys. Res.* 86, 3689-3694 (1981).
- "Thermodynamics of Solid Solution Formation in the Systems NiO-MgO and NiO-ZnO", P. K. Davies and A. Navrotsky, *J. Solid State Chem.* 38, 264-276 (1981).
- "Some Thermodynamic Properties of Fluorapatite, Fluoropargasite, and Fluorphlogopite", H. R. Westrich and A. Navrotsky, *Amer. J. Sci.* 281, 1091-1103 (1981).
- "Thermodynamic Parameters of  $CaMgSi_2O_6$ - $Mg_2Si_2O_6$  Pyroxenes Based on Regular Solution and Cooperative Disorder Models by Holland, Navrotsky, and Newton (1979). Reply to Discussion of Lindsley and Davidson (1980)", T. J. B. Holland, A. Navrotsky, and R. C. Newton, *Contr. Mineral. Petrol.* 75(3), 305-306.
- "Thermodynamic Properties of Crystals and Melts Based on Calorimetric Data and Plagioclase-Melt Equilibria in the System Albite-Anorthite-Diopside", D. J. Henry, A. Navrotsky, and H. D. Zimmermann, *Geochim. Cosmochim. Acta* 46, 381-391 (1982).
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