

David J. Wesolowski
Oak Ridge National Laboratory (ORNL)
wesolowskid@ornl.gov

Education/Training:

University of Pittsburgh, PA, USA	B.S.	1976	Geology
The Pennsylvania State University, PA, USA	Ph.D.	1984	Geochemistry

Professional Experience:

2010-present Leader, Geochemistry and Interfacial Sciences Group, ORNL
2009-present Director, FIRST Energy Frontier Research Center, ORNL
2002-present Distinguished R&D Staff, Chemical Sciences Division, ORNL
1995-2001 Senior Research Staff, Chemical Sciences Division, ORNL
1989-1996 Leader, Geochemistry Group, ORNL
1985-1989 Research Staff, Geochemistry Group, ORNL
1983-1985 Eugene P. Wigner Fellow, Chemistry Division, ORNL
1976-1977 Exploration Geologist, U.S. Steel Corp., Virginia, MN, USA
1974-1976 Geology Intern, U.S. Bureau of Mines, Pittsburgh, PA, USA

**10 Most Cited Peer-Reviewed Publications (138 Total through March, 2016),
H-Index 36, >4000 Citations (Web of Science):**

- Horita, J.; **Wesolowski, D.J.**; 1994, Liquid-Vapor Fractionation of Oxygen and Hydrogen Isotopes of Water from the Freezing to the Critical-Temperature, *Geochim. Cosmochim. Acta*, 58, 3425-3437.
- Zhang, Z. Fenter, P.; Cheng, L.; Sturchio, N.C.; Bedzyk, M.J.; Predota, M.; Bandura, A.; Kubicki, J.D., Lvov, S.N.; Cummings, P.T.; Chialvo, A.A.; Ridley, M.K.; Benezeth, P.; Anovitz, L.M., Palmer, D.A.; Machesky, M.L.; **Wesolowski, D.J.**; 2004, Ion Adsorption at the Rutile-Water Interface: Linking Molecular and Macroscopic Properties, *Langmuir*, 20, 4954-4969.
- Predota, M.; Bandura, A.V.; Cummings, P.T.; Kubicki, D.J.; **Wesolowski, D.J.**, Chialvo, A.A.; Machesky, M.L.; 2004, Electric Double Layer at the Rutile (110) Surface. 1. Structure of Surfaces and Interfacial Water from Molecular Dynamics by Use of Ab Initio Potentials, *J. Phys. Chem. B*, 108, 12049-12060.
- French, R.H., et al.; 2010, Long Range Interactions in Nanoscale Science, *Rev. Modern Physics*, 82, 1887-1944 (DOE Office of Basic Energy Sciences Sponsored Workshop Summary).
- Wesolowski, D.J.**; Palmer, D.A.; 1994, Aluminum Speciation and Equilibria in Aqueous Solution. 5. Gibbsite Solubility at 50 °C and pH 3-9 in 0.1 Molal NaCl Solutions (A General Model for Aluminum Speciation – Analytical Methods), *Geochim. Cosmochim. Acta*, 58, 2947-2969.
- Wang, W.; Gu, B.H.; Liang, L.Y.; Hamilton, W.A.; **Wesolowski, D.J.**; 2004, Synthesis of Rutile (α -TiO₂) Nanocrystals with Controlled Size and Shape by Low-Temperature Hydrolysis: Effects of Solvent Composition, *J. Phys. Chem. B*, 108, 14789-14792.
- Machesky, M.L.; **Wesolowski, D.J.**; Palmer, D.A.; Ichiro-Hayashi, K.; 1998, Potentiometric Titrations of Rutile Suspensions to 250 °C, *J. Colloid Interface Sci.*, 200, 298-309.

- Wesolowski, D.J.;** 1992, Aluminum Speciation and Equilibria in Aqueous Solution. 1. The Solubility of Gibbsite in the System Na-K-Cl-OH-Al(OH)₄ to 100 °C, *Geochim. Cosmochim. Acta*, 56, 1065-1091.
- Dickson, A.G.; **Wesolowski, D.J.**, Palmer, D.A., Mesmer, R.E.; 1990, Dissociation Constant of Bisulfate Ion in Aqueous Sodium Chloride Solutions to 250 °C, *J. Phys. Chem.*, 94, 7978-7985.
- Horita, J.; Cole, D.R.; **Wesolowski, D.J.;** 1995, The Activity-Composition Relationship of Oxygen and Hydrogen Isotopes in Aqueous Salt Solutions. 3. Vapor-Liquid Water Equilibration of NaCl Solutions to 350 °C, *Geochim. Cosmochim. Acta*, 59, 1139-1151.

Recent Synergistic Activities:

- Geochemical Society: Secretary, 1995-2001; Board of Directors, 2008-2011
Associate Editor, *Geochimica et Cosmochimica Acta*, 1992-2007, Joint Publications Committee, 2008-2012.
- Editorial Advisory Board, *Chemical Geology*, 1999-2012.
- Workshop Participant, *Basic Research Needs for Innovation and Discovery of Transformative Experimental Tools*, DOE Office of Basic Energy Sciences, Bethesda, MD. To be held June 1-3, 2016.
- Workshop Participant, *Basic Research Needs for Environmental Management*, DOE Office of Basic Energy Sciences, Bethesda, MD, July 8-11, 2015.
- Invention Disclosure “A Proton Selective Membrane Made from Single Layer Graphene”, D.J. Wesolowski, et al., ID-3519 Filed April 22, 2015.
- Invention Disclosure “Method for Separating Trivalent Rare Earth Elements from Waste Streams” D.J. Wesolowski and M.L. Machesky, ID-2811 Filed Feb. 29, 2012.
- Symposium Organizer, “Hydrothermal Geochemistry”, 15th International Conference on the Properties of Water and Steam, Berlin, Germany, Sept. 7-11, 2008.
- Symposium Organizer, “Interfacial Electrochemistry and Chemistry in High Temperature Media”, 212th Electrochemical Society Annual Meeting, Washington, D.C., Oct. 7-12, 2007.
- Workshop Participant and Writer, *Basic Research Needs for Geosciences*, DOE Office of Basic Energy Sciences, Bethesda, MD, Feb. 21-23, 2007.
- Workshop Participant and Writer, *Basic Research Needs for Materials Under Extreme Environments*, DOE Office of Basic Energy Sciences, Bethesda, MD. June 11-13, 2007.

Awards and Honors:

- 1992 **ORNL Significant Event Award (SEA)**: Publication definitive of aluminum aqueous chemistry research.
- 1993 **ORNL Showcase Lecture**, “Fluid-Rock Interactions in the Earth’s Crust”.
- 1996 **ORNL R&D Accomplishment Award**, Aluminum geochemistry research.
- 2000 **ORNL SEA**: Funding of multi-institutional, multidisciplinary DOE/BES project “Nanoscale Complexity at the Oxide/Water Interface”.

- 2005 **Best National Laboratory Presentation:**, DOE/BES Geoscience Research Symposium on Analytical and Isotope Geochemistry, Gaithersburg, MD. June 5-6, 2005.
- 2009 **ORNL SEA:** Funding of the FIRST Energy Frontier Research Center.
- 2010 **US Patent #7,665,524** “Liquid Metal Heat Exchanger for Efficient Heating of Soils and Geologic Formations”, R.C. DeVault and D.J. Wesolowski.
- 2010 **ORNL Incentivized Performance Award (IPA):** Successful launch of FIRST Center.
- 2011 **ORNL IPA:** Excellence in managing the FIRST Center, Future vision for the core BES/Geoscience project.
- 2012 **ORNL IPA:** Excellence in managing the FIRST Center, Future vision for the core BES/Geoscience project.
- 2013 **ORNL IPA:** Development of vision and proposal for renewal of the FIRST Center.
- 2014 **ORNL IPA:** Successful renewal of the FIRST Energy Frontier Research Center.

Presentations During the Last 5 Years:

- Invited Keynote Lecture to be Delivered: “*Electrochemical Carbon Research in the FIRST Energy Frontier Research Center*”, Carbon 2016, The World Conference on Carbon, University Park, PA, USA, July 10-15, 2016.
- Invited Lecture: “*The Fluid Interface Reactions, Structures and Transport Energy Frontier Research Center*”, ORNL Chemistry and Materials Science Seminar Series, Oak Ridge National Laboratory, Oak Ridge, TN, USA, Nov. 4, 2015.
- Invited Keynote Lecture: “*Fluid Interface Reactions, Structures and Transport (FIRST) Energy Frontier Research Center*”, Electrochemical Society Annual Meeting, Phoenix, AZ, USA, Oct. 11-16, 2015.
- Invited Keynote Lecture: “*Structure, Dynamics and Reactivity of the Interface Between Aqueous Solutions and Mineral Surfaces*”, American Chemical Society Spring Meeting, Denver, CO, March 22-26, 2015.
- Invited Seminar: “*Structure, Dynamics, Transport and Reactivity at Energy-Relevant Interfaces: Adventures in Electrical Energy Storage and Geosciences*”, Ohio State University, March 6, 2015.
- Invited Seminar: “*Electrical Energy Storage Research in the FIRST Energy Frontier Research Center*”, University of California, Riverside, Feb. 13, 2015.
- Invited Lecture: “*Structure and Dynamics of Energy-Relevant Fluid-Solid Interfaces*”, American Institute of Chemical Engineers Annual Meeting, Atlanta, GA, USA, Nov. 16-21, 2014.
- Invited Seminar: “*Electrical Energy Storage Research in the FIRST Energy Frontier Research Center*”, Huazhong University of Science and Technology, Wuhan, China, Nov. 13, 2014.
- Invited Seminar: “*X-ray and Neutron Scattering, Integrated with Multiscale Modeling, Reveals the Structure and Dynamics of Fluid-Solid Interfaces*”, City University of Hong Kong, Hong Kong, China, Nov. 7, 2014.
- Invited Seminar: “*Capacitive Electrical Energy Storage Research in the FIRST Energy Frontier Research Center*”, Münster Electrical Energy Technology Center, Universität Münster, Münster, Germany, June 2, 2014.

- Invited Plenary Lecture: “*The Oxide-Water Interface: Neither Oxide Nor Water*”, IAP2014, Interfaces in Water and Environmental Science, Leeuwarden, Netherlands, May 25-28, 2014.
- Invited Lecture: “*Capacitive Energy Storage Research in the FIRST Energy Frontier Research Center*”, Materials Research Society Spring Meeting, San Francisco, CA, USA, Apr, 20-24, 2014.
- Invited Lecture: “*Neutron (and X-ray) Scattering Probes of the Structures and Transport Properties of Electrolytes at Carbon Interfaces*”, American Chemical Society Spring Meeting, Dallas, TX, USA, March 16-21, 2014.
- Invited Lecture: “*Development of Experimentally Guided and Validated Computational Models of Interfacial Structure and Dynamics*”, American Chemical Society Spring Meeting, Dallas, TX, USA, March 16-21, 2014.
- Invited Lecture: “*Capacitive Electrical Energy Storage Research in the FIRST Energy Frontier Research Center*”, Advanced Automotive Battery Conference, Atlanta, Georgia, USA, Feb. 2-6, 2014.
- Invited Presentation: “*Reaction and Transport in Porous Media: Geologic and Electrical Energy Storage Systems*”, ORNL Physical Sciences Directorate Information Meeting, Oak Ridge National Laboratory, Oak Ridge, TN, USA, Feb. 26, 2013.
- Invited Lecture: “*21st Century Hydrothermal Geochemistry: Atomistic Perspectives*”, 16th International Conference on the Properties of Water and Steam, Greenwich, UK, Sept. 1-5, 2013
- Invited Lecture: “*X-ray Reflectivity and Neutron Scattering Studies of Electrode-Electrolyte Interactions in the FIRST Energy Frontier Research Center*”, American Chemical Society Spring Meeting, New Orleans, LA, April 7-11, 2013.
- Invited Lecture: “*Structure and Dynamics of the First Few Layers of Water on Rutile-Structured TiO₂ and SnO₂ (110) Surfaces of Bulk Crystals and Nanoparticles: Progress and Controversy*”, American Chemical Society Spring Meeting, New Orleans, LA, April 7-11, 2013.
- Invited Lecture: “*Integrated Computational and Experimental Studies of Carbon Electrode-Electrolyte Interactions*”, American Chemical Society Spring Meeting, New Orleans, LA, April 7-11, 2013.
- Invited Lecture, “*Neutrons and Geosciences*”, DOE, Office of Basic Energy Sciences, Earth Science Advisory Board Annual Meeting, Gaithersburg, MD, May 7, 2013.
- Invited Lecture: “*Fluid Interface Reactions, Structures and Transport (FIRST) Center*”, Prime 2012: Joint International Meeting of The Electrochemical Society and The Electrochemical Society of Japan, Honolulu, Hawaii, USA, Oct. 7-17, 2012.
- Invited Seminar: “*Interfacial Probe Techniques*”, Pre-Meeting Workshop on Electrochemical Capacitors, J.R. Miller, Organizer, Prime 2012: Joint International Meeting of The Electrochemical Society and The Electrochemical Society of Japan, Honolulu, Hawaii, USA, Oct. 7, 2012.
- Invited Lecture: “*Temperature, Charge and Radius Dependence of Multivalent Cation Adsorption on Rutile (α -TiO₂) in Aqueous 1:1 Electrolytes*”, V.M. Goldschmidt Conference, Montreal, Canada, June 24-29, 2012.
- Invited Plenary Lecture: “*Geochemistry, Interfaces and High Temperature Oxidation*”, Gordon Research Conference on High Temperature Corrosion, Colby-Sawyer College, New London, NH, USA, July 23-29, 2011.