**Dr. James R. Keiser**

Distinguished Research and Development Staff Member, Oak Ridge National Laboratory

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Education and training:

B.S. in Science Engineering with the Materials Science Option, Northwestern University

Ph.D. in Metallurgical Engineering, University of Missouri-Rolla

Research Associate, Metallurgical Engineering Department, University of Missouri-Rolla

Research Associate, Metallurgical Engineering Dept, University of Illinois–Urbana-Champaign

Work Experience:

August, 1974-present Distinguished Research & Development Staff Member, Corrosion Science and Technology Group, Materials Science and Technology Division, Oak Ridge National Laboratory

Dr. Keiser has over 45 years of experience at Oak Ridge National Laboratory studying the compatibility of materials with the environment of energy producing systems. Studies have addressed the performance of metallic, ceramic and elastomeric materials in environments containing gaseous and liquid corrodents. Environments studied have included molten fluoride, chloride, sulfide, nitrate and carbonate salts, molten metals, mixtures of hydrocarbon liquids, supercritical carbon dioxide as well as aggressive gaseous species such as hydrogen sulfide, steam, sulfur dioxide and hydrogen chloride. Current and recent projects include compatibility of materials with molten fluoride and chloride salts, corrosion issues in biomass liquefaction and gasification, corrosion issues in superheater tubes in biomass-fired boilers, material performance in high temperature supercritical carbon dioxide, corrosion-fatigue studies of receiver tubes in concentrating solar power systems, and performance of alternate fuel rod clad materials in high temperature, high pressure steam and hydrogen.

June, 1966-August, 1967 Alton Box Board Company, R&D Department, Alton Illinois

Technical publications demonstrating broad capabilities:

Dr. Keiser has over 280 technical publications including:

- B. A. Pint, R. G. Brese and J. R. Keiser, “Supercritical CO2 Compatibility of Structural Alloys at 400°-750°C”, Proceedings of NACE CORROSION 2016, paper C2016-7747, Vancouver, BC, Mar 6-10, 2016.

- B. A. Pint and J. R. Keiser, “Initial Assessment of Ni-Base Alloy Performance in 0.1 MPa and Supercritical CO2”, JOM, Vol. 67, No. 11, 2015.

- Bruce A Pint and James R Keiser, “The Effect of Temperature on the sCO2 Compatibility of Conventional Structural Alloys”, 4th International Symposium – Supercritical CO2 Power Cycles September 9-10, 2014, Pittsburgh, PA

- Keiser, J.R., Brady, M.P., Thomson, J.K., Connatser, R.M., Lewis, S.A., Sr., Leonard, D.N., “Bio-Oil Properties and Effects on Containment Materials”, Proceedings of the NACE International Corrosion 2014, March 9-13, 2014, Paper no. 4423, San Antonio, TX.

- Keiser, J.R., Brady, M.P., Lewis, S.A., Sr., Connatser, R.A., Thomson, J.K., Leonard, D.N., “Corrosion Considerations In Selection Of Structural Materials For Thermochemical Processing Of Biomass”, proceedings from the 2014 International Chemical Recovery Conference, Tampere, Finland, June 9-12, 2014.

- James R Keiser, James G Hemrick, Roberta A Meisner, Peter J Blau and Bruce A Pint, “Selection And Performance Of Materials For Biomass Gasifiers”, Proceedings of the 2010 International Chemical Recovery Conference, Williamsburg, VA, Mar 29-Apr 1, 2010.

- James R Keiser, Joseph R Kish and Douglas L Singbeil, “Alternate Materials for Recovery Boiler Superheater Tubes”, invited chapter in book for 45th Anniversary International Recovery Boiler Conference, June 2009

- James R Keiser, Joseph R Kish, Laurie A Frederick, Adam W Willoughby, Kimberly A Choudhury, Douglas L Singbeil, François R Jetté, J. Peter Gorog, “Recovery Boiler Superheater Corrosion Studies”, Proceedings of the International Chemical Recovery Conference, Quebec City, QC, Canada, May 29-June 1, 2007. - **Winner of Conference Best Paper Award**

- James R Keiser, Roberta A Peascoe, James G Hemrick, Camden R Hubbard, Gorti B Sarma, J. Peter Gorog and Zia Abdullah, “Materials Performance in High-temperature Black Liquor Gasification”, Paper No 05314, Proceedings of Corrosion/2005, NACE International, Houston, TX, March, 2005.

- James R Keiser, Robert DeCarrera, David G Newport, Robert S Rowbottom and Bruce A Pint, “Materials Issues in Black Liquor Steam Reforming/Gasification”, Proceedings of the 2005 TAPPI Engineering, Pulping and Environmental Conference, Philadelphia, August, 2005.

- D.L. Hindman and J. R. Keiser, “Performance of Ceramic-Ceramic Composites in an Industrial Waste Incinerator,” Paper No. 191, CORROSION/94, Baltimore, Maryland, February 27-March 4, 1994.

-J.R. Keiser, J. I. Federer, J. J. Williams, and R. A. Rosenberg, “Evaluation of Ceramic Materials for an Advanced Steam-Methane Reformer,” Paper No. 239, CORROSION/93, New Orleans, Louisiana, March 8-12, 1993.

-J.R. Keiser, P. F. Tortorelli and J.H. DeVan, "Corrosion of Type 316 Stainless Steel in Molten LiF-LiCl-LiBr," *J. Nucl. Mater.*, vol. 103(1-3), pp. 675-80 (1981).

- J. R. Keiser, D. L. Manning and R.E. Clausing, "Corrosion Resistance of Some Nickel-Base Alloys to Molten Fluoride Salts Containing UF4 and Tellurium," pp. 315-28 in *Molten Salts*, The Electrochemical Society, New York, 1976.

- J.R. Keiser and J.H. DeVan, "Design and Operation of Thermal Convection Loops for Corrosion Measurements in Molten LiF-LiCl-LiBr," Paper No. 117, *Corrosion/79*, National Association of Corrosion Engineers, Atlanta, Georgia.

- J. R. Keiser, “Status of Tellurium-Hastelloy N Studies in Molten Fluoride Salt”, ORNL/TM-6002 (October 1977).

- J.R. Keiser “Compatibility Studies of Potential Molten Salt Breeder Reactor Materials in Molten Fluoride Salts*”*, ORNL/TM-5783 (May 1977).

Patents:

MgAl2O4 Spinel Refractory As Containment Liner For High-Temperature Alkali Salt Containing Environments

Methods Of Use Of Calcium Hexa Aluminate Refractory Linings and/or Chemical Barriers In High Alkali Or Alkaline Environments

Synergistic Activities:

Eleven conference or journal “Best Paper” awards

2009 R&D 100 Award for Alumina Forming Austenitic Steel

Martin Marietta Energy Systems 1987 Technical Achievement Award

Fellow of ASM International

Fellow of NACE International

TAPPI Engineering Division Technical Award and Beloit Prize