MICHAEL FORREST SIMPSON, Ph.D.

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A. Education and Training

B.S. w/Honors, Chemical Engineering, California Institute of Technology, Pasadena, CA, 1991
M.A., Chemical Engineering, Princeton University, Princeton, NJ, 1993
Ph.D., Chemical Engineering, Princeton University, Princeton, NJ, 1996

B. Research and Professional Experience

12/21 –	Professor, Materials Science & Engineering, University of Utah, Salt Lake City, UT
7/19 – 12/21	Professor and Department Chair, Materials Science & Engineering, University of Utah, Salt Lake City, UT
7/18 – 6/19	Professor and Department Chair, Metallurgical Engineering, University of Utah, Salt Lake City, UT
7/17 – 6/18	Professor and Associate Department Chair, Metallurgical Engineering, University of Utah, Salt Lake City, UT
8/13 – 6/17	Associate Professor, Metallurgical Engineering, University of Utah, Salt Lake City, UT
2/05 – 7/13	Principal Investigator/Department Manager, Pyroprocessing Technology Department, Idaho National Laboratory, Idaho Falls, ID
2/96 – 1/05	Research Scientist, Nuclear Technology Division, Argonne National Laboratory-West, Idaho Falls, ID
1/92 – 1/96	Graduate Research Assistant, Princeton University, Princeton, NJ
6/91 – 9/91	Summer Research Engineer, ARCO Oil & Gas Company, Plano, TX
6/90 – 8/90	Summer Undergraduate Research Fellow, California Institute of Technology, Pasadena, CA
6/89 – 9/89	Summer Research Intern, Jet Propulsion Laboratory, Pasadena, CA

C. Publications

1. **M.F. Simpson**; "Fundamentals of Spent Nuclear Fuel Pyroprocessing," *Nuclear Fuel Reprocessing and Waste Management*, ed. J. Zhang, World Scientific Publishing Co., pp. 27-53, 2018. https://doi.org/10.1142/9789813271371_0002
2. D.E. Hamilton*, M. Gonzalez, and **M.F. Simpson**, "Application of Zero Resistance Ammeter to Real Time Measurement of Redox Control in Molten Chloride Salts," *Journal of Radioanalytical and Nuclear Chemistry*, 2022, https://doi.org/10.1007/s10967-022-08509-5.
3. J. McDuffee, R. Christensen, D. Eichel, **M. Simpson**, S. Phongikaroon, X. Sun, J. Baird, A. Burak, S. Chapel, J. Choi, J. Gorton, D.E. Hamilton*, D. Killinger*, S. Miller, J. Palmer, C. Petrie, D. Sweeney, A. Schrell, and J. Vollmer, "Design and Control of a Fueled Molten Salt Cartridge Experiment for the Versatile Test Reactor," *Nuclear Science and Engineering*, 2022. https://doi.org/10.1080/00295639.2021.2017663

4. C. Zhang*, D. Rappleye, A. Nelson, S. Simpson, and **M.F. Simpson**, "Electroanalytical Measurements of Oxide Ions in Molten $CaCl_2$ on W electrode," *Journal of the Electrochemical Society*, vol. 168, n. 9, 2021, https://doi.org/10.1149/1945-7111/ac208e.
5. S. Choi, A. Strianese*, O. Dale*, and **M.F. Simpson**, "Electrochemical Measurements for Assessing Corrosion of Metal Alloys in Molten LiF-NaF-KF and $MgCl_2$-NaCl-KCl," *Journal of Materials*, 2021. https://doi.org/10.1007/s11837-021-04843-3
6. H. Zhang*, S. Choi, E. Hamilton*, and **M.F. Simpson**; "Electroanalytical measurements of UCl_3 and $CeCl_3$ in molten NaCl-$CaCl_2$," *Journal of the Electrochemical Society*, 2021, 168, 056521, DOI: 10.1149/1945-7111/ ac0222.
7. E. Faulkner*, M. Monreal, M. Jackson, and **M.F. Simpson**, "Effect and Measurement of Residual Water in $CaCl_2$ Intended for Use as Electrolyte in Molten Salt Electrochemical Processing," *Journal of Radioanalytical and Nuclear Chemistry*, 326(2), 1289-1298, 2020, DOI 10.1007/s10967-020-07413-0.
8. D. Horvath*, O. Dale*, and **M.F. Simpson**, "Electrochemical Response of Metal Alloys to Oxygen Gas Bubbling in Molten LiCl-Li_2O Melt," *Journal of Radioanalytical and Nuclear Chemistry*, https://doi.org/10.1007/s10967-019-06925-8
9. H. Zhang*, S. Choi, C. Zhang*, E. Faulkner*, N. Alnajjar*, P. Okabe*, D.C. Horvath*, and **M.F. Simpson**; "Square Wave Voltammetry for Real Time Analysis of Minor Metal Ion Concentrations in Molten Salt Reactor Fuel;" *Journal of Nuclear Materials*, vol. 527, 2019.
10. C. Zhang*, J. Wallace*, and **M.F. Simpson**, Electrochemical Measurement of High Concentration of UCl_3 and $GdCl_3$ in Molten LiCl-KCl Eutectic," *Electrochimica Acta*, 2018. https://doi.org/10.1016/j.electacta.2018.08.087

D. Synergistic Activities

1. Regularly teaching courses on thermodynamics and nuclear materials at the University of Utah.
2. Formerly, principal investigator (PI) for a multi-university project to develop functional components for a molten salt irradiation project for the Versatile Test Reactor (2018-2021).
3. Currently, PI on a project funded by Lawrence Livermore National Laboratory to develop molten salt-based metal processing with electrochemical sensors.
4. Currently, PI on a project funded by Los Alamos National Laboratory to use electrochemical measurements to measure fundamental chemical properties of molten salt mixtures for molten salt reactors.
5. Peer reviewer for several nuclear and electrochemical journals, including but not limited to *Journal of Nuclear Materials, Nuclear Technology, Nuclear Engineering and Design, Annals of Nuclear Energy, Journal of the Electrochemical Society, Journal of Radioanalytical and Nuclear Chemistry, Ionics, and Electrochimica Acta*