

Curriculum Vitae

Cheol Min Lee, Ph.D.

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Affiliation

2018.10-Present **Postdoctoral Research Associate**, Neutron Science Division, Korea Atomic Energy Research Institute (KAERI)

Education

2014.03-2018.08 **Doctor of Philosophy in Nuclear Engineering, Ulsan National Institute of Science and Technology (UNIST)**

- Dissertation title: Enhanced Accident Performance of Zirconium Alloy Cladding Tube by High-Temperature Preformed Oxide and Analysis of Preformed Oxide Microstructures
- Advisor – Prof. Dong-Seong Sohn and Prof. Deokjung Lee

2010.03-2014.02 **Bachelor of Engineering, Ulsan National Institute of Science and Technology (UNIST)**

- Nuclear Science & Engineering, Thermo-Fluid & Power Engineering

Publications

1. **C.M. Lee**, Y.-K. Mok, D.-S. Sohn, High-temperature steam oxidation and oxide crack effects of Zr-1Nb-1Sn-0.1Fe fuel cladding, *J. Nucl. Mater.* 496 (2017) 343-352. (5Y IF 2.453)
2. **C.M. Lee**, D.-S. Sohn, Enhanced high-temperature oxidation resistance of a zirconium alloy cladding by high-temperature preformed oxide on the cladding, *Corros. Sci.* 131 (2018) 116-125. (5Y IF 5.238)
3. **C.M. Lee**, H.Y. Jeong, A. Yoon, Y.-K. Mok, D.-S. Sohn, Microstructural characteristics and effects of 800–1200°C preformed oxides on high-temperature steam oxidation of a zirconium alloy cladding, *J. Alloys Compd.* 753 (2018) 119-129. (5Y IF 3.315)
4. **C.M. Lee**, H.Y. Jeong, A. Yoon, Y.-K. Mok, D.-S. Sohn, Microstructural analysis of

performed oxides on a zirconium alloy before and after subsequent oxidation at 1000–1200 °C, *Corros. Sci.* 139 (2018) 410-420. (5Y IF 5.238)

5. **C.M. Lee**, H.J. Lee, H.-G. Kim, Y.-K. Mok, D.-S. Sohn, Effect of pre-oxidation temperature on the ductility of a zirconium alloy cladding under simulated accident conditions, *J. Nucl. Mater.* 515 (2019) 80-90. (5Y IF 2.453)
6. **C. M. Lee**, Y.-S. Han, Y.-K. Mok, D.-S. Sohn, Study of mechanism of oxidation resistance enhancement induced by preformed oxide on zirconium alloys, *Corros. Sci.* 158 (2019) 108105. (5Y IF 6.235)
7. **C. M. Lee**, G. Kim, Y.-S. Han, Y.-K. Mok, D.-S. Sohn, Short communication on “self-crack-healing behavior of oxide formed on a zirconium alloy cladding tube”, *J. Nucl. Mater.* 526 (2019) 151749. (5Y IF 2.536)

Patents

Korea Patent

1. D.-S. Sohn, **C.M. Lee**, Nuclear fuel cladding tube and manufacturing method of the same, Korea Patent, No. 1020170040153, March 29, 2017 (PCT).

Research Experience

- **Design oxidation experiments of metals**
 - Zr-alloys, Ni-alloys have been covered.
- **Microstructure analysis**
 - SEM analysis for overall morphology
 - EPMA analysis for element composition
 - EBSD analysis for crystallography, texture, and deformation
- **TEM analysis**
 - Defects (dislocation, twin, and stacking fault) analysis
 - Phase identification using diffraction pattern
 - Analysis software (VESTA, GMS3, CrystalMaker, SingleCrystal)
- **XRD analysis**
 - Phase identification using Rietveld method
 - Defects (dislocation, twin, and stacking fault) analysis using full width half maximum (FWHM)
- **Mechanical tests and simulation**
 - Tensile tests, ring compression tests, and three point bending tests
 - Mechanical simulation using ABAQUS and ANSYS.

Awards

1. **National natural science and engineering scholarship**, Korean Student Aid Foundation, March, 2010 – February, 2014.
2. **Best presentation award**, Oxidation Kinetics of the Zr-1Nb-1Sn-0.1Fe at temperatures of 1000-1200°C, Korea Nuclear Society, Gyeongju, Korea, October 29-30, 2015.
3. **Best poster award**, High-temperature steam-oxidation behavior of Zr-1Nb-1Sn-0.1Fe cladding tube at temperatures of 800-1000°C, Korea Nuclear Society, Jeju, Korea, May 12-13, 2016.
4. **Best presentation award**, Enhanced Oxidation Resistance of a Zirconium Alloy Cladding Tube by High-Temperature Pre-Oxidation, The 3rd Asian Nuclear Fuel Conference, Jeju, Korea, September 8-9, 2017.
5. **Certificate of Excellence Research**, Commencement ceremony in UNIST, February 12, 2019.

Conference Presentations

International Conference Paper

1. **C.M. Lee**, J.S. Cheon, M.J. Kim, J.-K. Baek, J.-H. Kim, G.-Y. Jeong, B.-J. Cho, T.W. Cho, D.-S. Sohn, Development of a creep correlation for HT9, The 2nd Asian Nuclear Fuel Conference, Sendai, Japan, September 18-19, 2014.
2. **C.M. Lee**, T.W. Cho, G.Y. Jeong, M.J. Kim, J.-H. Kim, Y.-K. Mok, D.-S. Sohn, High Temperature Oxidation of the Zr-1Nb-1Sn-0.1Fe Cladding tube at the Temperatures of 1000 - 1200°C, International Congress on Advances in Nuclear Power Plants, San Francisco, United States of America, April 17-20, 2016.
3. **C.M. Lee**, D.-S. Sohn, Microstructure Analysis of a Zirconium Alloy after High Temperature Steam Oxidation, Quench Workshop, Karlsruhe, Germany, October 18-20, 2016.
4. **C.M. Lee**, T.W. Cho, G.Y. Jeong, M.J. Kim, H.-J. Lee, J.-H. Kim, D.-S. Sohn, A new Method to Enhance the Oxidation Resistance of a Zirconium Alloy Cladding: High-Temperature Pre-Oxidation, Water Reactor Fuel Performance Meeting, Jeju, Korea, September 10-14, 2017.
5. **C.M. Lee**, T.W. Cho, G.Y. Jeong, M.J. Kim, H.-J. Lee, J.-H. Kim, D.-S. Sohn, Enhanced Oxidation Resistance of a Zirconium Alloy Cladding Tube by High-Temperature Pre-Oxidation, The 3rd Asian Nuclear Fuel Conference, Jeju, Korea, September 8-9, 2017.

6. **C.M. Lee**, D.-S. Sohn, Microstructure changes of Zr-1Nb-1Sn-0.1Fe cladding tube during LOCA simulated conditions, 12th International Conference on WWER Fuel Performance, Nessebar, Bulgaria, September 16-23, 2017.
7. **C.M. Lee**, D.-S. Sohn, A New Approach to Enhance the Oxidation Resistance of a Zirconium Alloy: High-Temperature Pre-Oxidation, Quench Workshop, Karlsruhe, Germany, October 17-19, 2017.
8. **C.M. Lee**, Y.-K. Mok, D.-S. Sohn, Enhanced High-Temperature Performance of a Zirconium Alloy Cladding by High-Temperature Preformed Oxide, American Nuclear Society, Philadelphia, United States of America, June 18-21, 2018.

Domestic Conference Paper

1. **C.M. Lee**, J.S. Cheon, D.-S. Sohn, Analysis of Current HT9 Creep Correlations and Modification, Korea Nuclear Society, Jeju, Korea, May 29-30, 2014.
2. **C.M. Lee**, J.-K. Baek, D.-S. Sohn, Breakaway Oxidation of Constrained Zirlo at 1000°C, Korea Nuclear Society, Pyeongchang, Korea, October 30-31, 2014.
3. **C.M. Lee**, D.-S. Sohn, Oxidation Kinetics of the Zr-1Nb-1Sn-0.1Fe at temperatures of 1000-1200°C, Korea Nuclear Society, Gyeongju, Korea, October 29-30, 2015.
4. **C.M. Lee**, T.W. Cho, G.Y. Jeong, M.J. Kim, J.-H. Kim, H.-J. Lee, Y.-K. Mok, D.-S. Sohn, High-temperature steam-oxidation behavior of Zr-1Nb-1Sn-0.1Fe cladding tube at temperatures of 800-1000°C, Korea Nuclear Society, Jeju, Korea, May 12-13, 2016.
5. **C.M. Lee**, H.-J. Lee, T.W. Cho, G.Y. Jeong, M.J. Kim, J.-H. Kim, Y.-K. Mok, D.-S. Sohn, Oxidation Resistance Enhancement of a Zirconium Alloy by High-Temperature Pre-Oxidation, Korea Nuclear Society, Gyeongju, Korea, October 26-27, 2017.
6. **C.M. Lee**, D.-S. Sohn, Microstructure Characterization of Oxide Formed on a Zirconium Alloy after High-Temperature Steam Oxidation at 800-1200°C, 대한금속재료학회, Jeju, Korea, April 25-27, 2018.
7. **C.M. Lee**, T.W. Cho, G.Y. Jeong, M.J. Kim, H.-J. Lee, J.-H. Kim, Y.-K. Mok, D.-S. Sohn, Effects of Preformed Oxide on Enhancing High-Temperature Oxidation Resistance of a Zirconium Alloy Cladding Tube, Korea Nuclear Society, Jeju, Korea, May 17-18, 2018.
8. **C.M. Lee**, T.W. Cho, G.Y. Jeong, M.J. Kim, H.-J. Lee, J.-H. Kim, Y.-K. Mok, D.-S. Sohn, Effects of Preformed Oxide on Enhancing High-Temperature Oxidation Resistance of a Zirconium Alloy Cladding Tube, Korea Nuclear Society, Jeju, Korea, May 17-18, 2018.
9. **C.M. Lee**, S. Yoon, J. Park, H. Ko, J. Park, K.H. Park, Investigation of Fuel Pellet Interaction with Zirconium Dioxide and Fission Products in LWR, Korea Nuclear Society, Yeosu, Korea, October 25-26, 2018.

10. **C.M. Lee**, G.Y. Jeong, D.-S. Sohn, Y.-S. Han, Aspect of Breakaway Oxidation of a Zirconium Alloy Cladding Tube during Oxidation at 800 °C, Korea Nuclear Society, Jeju, Korea, May 23-24, 2019.