

Thomas P. Nigl

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EDUCATION

Pennsylvania State University University Park, PA
Ph.D. Candidate Aug 2016–Aug 2020
Advisor: Dr. Hojong Kim

Northeastern University Boston, MA
Bachelor of Science, Chemical Engineering, *cum laude* Sept 2011–May 2016

RESEARCH EXPERIENCE

Pennsylvania State University, Dept. of Materials Science and Engineering University Park, PA
Graduate Research Assistant Aug 2016–Present

- Utilized liquid metal electrodes to selectively remove alkaline-earth fission products from molten salt electrolyte to reduce chloride wastes generated during used nuclear fuel pyroprocessing
- Investigated fundamental mechanisms of tellurium-based corrosion and its effects on structural metals
- Created thermodynamic models of four binary alloy systems by synthesizing collected experimental data and CALPHAD software to elucidate their fundamental properties
- Managed supply chain of research chemicals and lab materials for a research group of 11 members and presented monthly reports of lab expenditures

Gachon University, Dept. of Chemical Engineering Seongnam, South Korea
Undergraduate Researcher July 2015–Aug 2015
Advisor: Dr. Sanghun Lee

- Constructed lithium ion battery cathode material crystals in computational modeling software
- Modeled crystal structure, defect chemistry, and ion transport of sodium ion battery cathode materials

RELATED ACTIVITIES

Pennsylvania State University University Park, PA
Executive Mentor, Science Policy Society 2019-2020

- Organized Science on Tap Workshop to train six Penn State satellite campus representatives on starting a Science on Tap program at their campus
- Created an event with four professionals discussing their research and how to navigate STEM fields as a member of the LGBTQ+ community

President, Science Policy Society 2018-2019

- Hosted a keynote lecture by Gina McCarthy, EPA Administrator under President Obama
- Transported 20 citizens to off-campus polling locations through a free election day carpool service
- Coordinated a two-day event for Science Policy Society members to discuss their research and scientific funding with Congressional representatives

Science on Tap Coordinator, Science Policy Society 2017-2018

- Increased Science on Tap attendance by 43% to an average of 57 people
- Negotiated event space with new venue to accommodate increasing number of attendees

– *Tour Guide for Steidle Building* 2018-2020
– *Council Member, Earth and Mineral Sciences Graduate Council* 2016-2017

TEACHING EXPERIENCE

Pennsylvania State University University Park, PA
Substitute Teaching Assistant, MATSE 460: Introductory Laboratory in Materials Fall 2019

- Graded two sets of informal laboratory reports
- Led four sessions of laboratory experiments in lieu of official teaching assistant

Pennsylvania State University

University Park, PA

Teaching Assistant, MATSE 421: Corrosion Engineering

Fall 2019

- Created grading rubrics and evaluated two midterm exams
- Assessed weekly homework assignments using constructed rubrics
- Planned and delivered two guest lectures for 40 students
- Accommodated extracurricular assistance with course material
- Hosted weekly office hours for students to further engage with course material

Teaching Assistant, MATSE 402: Materials Process Kinetics

Spring 2019

- Prepared and delivered two guest lectures for 90 students
- Graded weekly homework assignments
- Hosted weekly office hours for students to further engage with course material
- Planned three extracurricular reviews sessions for exam preparation
- Reviewed and edited three exams before dissemination to students
- Proctored three midterm exams

Teaching Assistant, MATSE 460: Introductory Laboratory in Materials

Fall 2016

- Guided weekly laboratory experiments and discussions with 22 students
- Developed new standard lesson plan for thermogravimetric analysis
- Graded informal laboratory reports

RESEARCH PUBLICATIONS

9. DeLeo, V.; Kuei, B.; **Nigl, T.** The Effects of Drilling the Marcellus Shale in Pennsylvania Addressed to: The General Assembly of Pennsylvania. *Journal of Science Policy & Governance*. 2019.
8. Gesualdi, J.; **Nigl, T. P.**; Lichtenstein, T.; Smith, N. D.; Kim, H. Thermodynamic Properties of Ba-Pb Alloys Determined by Emf Measurements Using Binary CaF_2 - BaF_2 electrolyte. *J. Electrochem. Soc.* 166(8), 2019, D268-D275.
7. Smith, N. D.; Orabona, N.; Lichtenstein, T.; Gesualdi, J.; **Nigl, T. P.**; Kim, H. Thermodynamic properties of Sr-Sb alloys via emf measurements using solid CaF_2 - SrF_2 electrolyte. *Electrochim. Acta.* 305, 2019, 547-554.
6. Cogswell, C.; **Nigl, T. P.**; Stavola, A.; Wolek, A.; Wang, Y.; Zummo, J.; Lin, Y.; Chinn, R.; Choi, S. Generation and Use of a Pure Titanium Pillared MCM-36 Structure as a High Efficiency Carbon Dioxide Capture Platform and Amine Loaded Solid Adsorbent. *Microporous Mesoporous Mater.* 280, 2019, 151-156.
5. **Nigl, T. P.**; Lichtenstein, T.; Smith, N. D.; Gesualdi, J.; Kong, Y.; Kim, H. Thermodynamic Properties of Strontium-Lead Alloys Determined by Electromotive Force Measurements. *J. Electrochem. Soc.* 165, 2018, H991-H998.
4. Lichtenstein, T.; **Nigl, T. P.**; Smith, N. D.; Kim, H. Electrochemical deposition of alkaline-earth elements (Sr and Ba) from LiCl-KCl-SrCl_2 - BaCl_2 solution using a liquid bismuth electrode. *Electrochim. Acta.* 281, 2018, 810-815.
3. Kundu, J.; Michaelson, A.; Baranov, P.; Chiumiento, M.; **Nigl, T.**, Young, M. J.; Carrier, R. L. Interphotoreceptor Matrix Based Biomaterial: Impact on Human Retinal Progenitor Cell Attachment and Differentiation. *J. Biomed. Mater. Res.* 106 (2), 2018, 891-899.
2. **Nigl, T. P.**; Smith, N. D.; Lichtenstein, T.; Gesualdi, J.; Kumar, K.; Kim, H. Determination of Thermodynamic Properties of Alkaline Earth-Liquid Metal Alloys Using the Electromotive Force Technique. *J. Vis. Exp.* 129, e56718, doi:10.3791/56718, 2017.
1. Lichtenstein, T.; Gesualdi, J.; **Nigl, T. P.**; Yu, C. T.; Kim, H. Thermodynamic Properties of Barium-Antimony Alloys Determined by Emf Measurements. *Electrochim. Acta.* 251, 2017, 203-211.

PROFESSIONAL EXPERIENCE

AMBRI, Inc.

Cambridge, MA

Cell Analysis Co-op

Jan 2016–July 2016, Jan 2015–June 2015, Jan 2014–Aug 2014

Advisors: Dr. David Bradwell, Dr. Jianyi Cui

- Reduced operating costs by \$40,000 by establishing in-house ceramic powder processing facility
- Designed and executed seven experimental campaigns to investigate properties of novel ceramic material resistant to high temperatures and chemical corrosion
- Documented ceramic processing with video SOP's; trained three co-op students with documentation
- Executed sample characterization, analyzed chemical data, and generated 130 analytical summaries

CONFERENCE TALKS AND SEMINARS

- Thermodynamic Properties of Strontium-Lead Alloys Determined by Electromotive Force Measurements, David L. Lawrence Convention Center, Pittsburgh, PA. Oct 25 2018.
- Renuclear: Use of a Molten Salt Breeder Reactor for Nuclear Reactor Decommissioning and Spent Fuel Disposal, Hilton San Francisco Union Square, San Francisco, CA. Nov 15 2016.
- Proceedings of AIChE Northeast Regional Student Conference: Insight in to Coordinated Conference Preparation, Salt Lake Marriott Downtown at City Creek, Salt Lake City, UT. Nov 07 2015.

POSTER SESSIONS

- **Nigl, T. P.**; Lichtenstein, T.; Smith, N. D.; Gesualdi, J.; Kong, Y.; Kim, H. "Thermodynamic Properties of Strontium-Lead Alloys Determined by Electromotive Force Measurements". 3M Fellowship Poster Session, St. Paul, MN. Oct 17 2018
- **Nigl, T. P.**; Stavola, A.; Ramberger, J.; Accetta, D.; Gilmore, E.; Cogswell, C. F.; Choi, S. "Generation and Use of Titanium Pillared MCM-36 Structure for Carbon Dioxide Capture" AIChE Student Poster Session. Salt Lake Marriott Downtown at City Creek, Salt Lake City, UT. Nov 09 2015.

AWARDS AND HONORS

- Best Department of Materials Science and Engineering Group Poster Award, 2019
- Roy G. Post Foundation Scholarship, 2018
- Coppola Graduate Student Excellence Award for Service and Leadership, 2018
- ARPA-E Energy Summit Graduate Fellow, 2018
- NSF Graduate Research Fellowship Honorable Mention, 2017
- George Schenck Teaching Assistant of the Year Award, 2017
- Omega Chi Epsilon Student of the Year Award, 2016
- Huntington 100 Award, 2016
- Jeffrey R. Pierce Outstanding Service Award, 2016