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Professional Preparation

University of Idaho, Moscow, Id, Mechanical Engineering, B.S., 2006
University of Utah, Salt Lake City, Ut, Metallurgical Engineering, Ph.D., 2017

Appointments

2017-present: Assistant Professor, Mining Engineering, University of Kentucky, Lexington, Ky
2014-2017: Research Assistant, Metallurgical Engineering, University of Utah, Salt Lake City, Ut
2014-present: Founder/Owner of Advanced Mechanics Materials and Processes LLC, Salt Lake City, Ut
2007-2014: Process Engineer, Honeywell Electronic Materials, Spokane, Wa

Products

(From 8 peer reviewed publications)

Five Relevant Publications

1. Honaker, R.Q., Zhang, W., **Werner, J.,** et al. "Enhancement of a Process Flowsheet for Recovering and Concentrating Critical Materials from Bituminous Coal Sources" Mining, Metallurgy & Exploration volume 37, pages 3–20 (2020).
2. Honaker, R., Zhang, W., **Werner, J.**, "Acid Leaching of Rare Earth Elements from Coal and Coal Ash: Implications for Using Fluidized Bed Combustion to Assist in the Recovery of Critical Materials." Energy & Fuels (2019).
3. Zongliang, Z., **Werner, J.**, Free, M., "Modeling Nickel Electrowinning with Electrode Diaphragms Based on Nernst-Plank Equation and a Volume Force Form of Darcy's Law" Journal of the Electrochemical Society 166.4 (2019): D120-D130.
4. Yang, X., **Werner, J.**, Honaker, R., "Leaching of rare Earth elements from an Illinois basin coal source." Journal of Rare Earths 37.3 (2019): 312-321.
5. **Werner, J.**, Zeng, W., Free, M. L., Zhang, Z., Cho, J., "Editors' Choice—Modeling and Validation of Local Electrowinning Electrode Current Density Using Two Phase Flow and Nernst–Planck Equations." Journal of the Electrochemical Society 165.5 (2018): E190-E207.

Five Other Significant Products

6. **Werner, J.**, "Single Stage Clarifier and Mixing Assembly," U.S. Patent Application No. 62/877,389, July 23, 2020.
7. **Werner, J.**, Chandra, A., Honaker, R., "Continuous Solvent Extraction Process for Generation of High Grade Rare Earth Oxides From Leachates Generated From Coal Sources," U.S. Patent Application No. 16/534,738, February 25, 2020.

8. Honaker, R., **Werner, J.**, Zhang, W., "Apparatus and Method for Power Generation and Valuable Element Recovery from Combustion By-products" U.S. Patent Application No. 16/773,081, February 25, 2020.
9. **Werner, J.**, "Ammoniacal Extraction of Copper, Gold and other Elements of Value" U.S. Provisional Patent Application No. 62/972,379, February 25, 2020.
10. **Werner, J.**, "Electrowinning Cells for the Segregation of the Cathodic and Anodic Compartments" U.S. Provisional Patent Application No. 62/972,405, February 26, 2020.

Synergistic Activities

1**. Selected Research (From ~$15.2M):**

- Honaker, R., (PI), **Werner, J.**, "Demonstration of Scaled-Production of Rare Earth Oxides and Critical Materials from Coal-Based Sources using Innovative, Low Cost Process Technologies and Circuits" DOE, October 2019 – March 2022, Total Project Value = $6,999,797; Agency Share = $6,291,390;
- Honaker, R., (PI), **Werner, J.**, Groppo, J., Yoon, R.H., Luttrell, G.H., Noble, A. and Herbst, J., "Phase 2: Pilot-Scale Testing of an Integrated Circuit for the Extraction of Rare Earth Minerals and Elements from Coal and Coal Byproducts Using Advanced Separation Technologies," U.S. Department of Energy/National Energy Technology Laboratory, Project No. DE-FE0027035, September 1, 2017 – March 31, 2020; Total Project Value = $7.50 million;
- Honaker, R. (PI), **Werner, J.**, "Phase 1: Production of Salable Rare Earths Products from Coal and Coal Byproducts in the U.S Coal Industry," Marshall Miller and Associates (U.S. DOE/NETL subaward), September 1, 2017 – February 28, 2019; Total Project Value = $368,500; Agency Share = $311,600;

2. **Selected Leadership:** Invention of a process to recover base metals (Cu, Ni, Co, Zn) and precious metals (Au, Ag) from E-wastes without the use of acids or cyanide; Oversaw design and construction of hydrometallurgical extraction circuit for a first in world rare earth element extraction pilot plant from coal and coal byproducts; Developed a novel solvent extraction process to concentrate rare earth elements from dilute aqueous feed streams; Led and mentored a team of "SuperUsers" to design, test, and train Honeywell Spokane to the new SAP Manufacturing Execution System.
3. **Selected Honors and Awards:** Editor's Choice, Journal of the Electrochemical Society, 2018; Henry Krumb Lecturer, SME, 2016-17; Outstanding Graduate Student Speaker, Metallurgical Engineering Department, University of Utah 2015-16; PhD. Fellowship Inaugural Award, SME, 2015. Honeywell Electronic Material, Spokane, Wa, Certified Six Sigma Blackbelt, 2012; Professional Engineer, Wa, 2013;
4. **Reviewer:** International Journal of Sustainable Manufacturing; Conference of Metallurgists; Mining, Metallurgy & Exploration; JOM; IEEE.
5. **Professional Activities:** Society of Mining Metallurgy and Exploration (2015-present).