BRAJENDRA MISHRA

Department of Mechanical & Materials Engineering
Worcester Polytechnic Institute
100 Institute Road, Worcester, MA 01609, USA
Tel: (508) 831-5711; Fax: (508) 831-5993
Email: bmishra@wpi.edu

Residence Address:
10 Whitehaven Lane
Worcester, MA 01609
Home: (508) 796-5283

PRESENT POSITIONS:
Kenneth G. Merriam Distinguished Professor: Mechanical & Materials Engineering
Donald M. Zwiep Distinguished Fellow: Worcester Polytechnic Institute
Director: Metal Processing Institute
Director: National Science Foundation Center for Resource, Recovery & Recycling
University Emeritus Professor, Metall. & Materials Engineering, Colorado School of Mines.

Additional Positions:
Chief Scientific Advisor: Global Minerals Recovery – a start-up focused on value-recovery from industrial mineral wastes.

EDUCATIONAL QUALIFICATION:
Ph.D., Thesis: University of Minnesota, Minneapolis, August 1986, Susceptibility of Inconel X-750 to stress-corrosion cracking.
M.S. [Matl.Sc.], Thesis: University of Minnesota, Minneapolis, March 1983, Electromigration of H_2 and D_2 in Tantalum: Isotope Effect.
B.Tech. [Met. Engr], Thesis: Indian Institute of Technology, Kharagpur, May 1981, Some studies on the magnetic ageing of electrical steels.

PROFESSIONAL EXPERIENCE (Academic):
Sept. 2001–Aug.2015: Professor, Kroll Institute for Extractive Metallurgy, Department of Metallurgical and Materials Engineering
Sept.1993-Aug. 2000: Associate Professor, Kroll Institute for Extractive Metallurgy, Department of Metallurgical and Materials Engineering
Sept. 1990-Aug. 1993: Research Assistant Professor, Kroll Institute for Extractive Metallurgy, Department of Metall. and Materials Engineering

PROFESSIONAL EXPERIENCE (Industry):
Sept. 1986-Aug. 1990: Product Development Engineer, R&D Division, Tata Steel, India.
May 1995-Sept. 1995: Faculty Intern, MOS-8 Division, Motorola, Austin, TX
May 1996-Aug. 1996: Faculty Intern, MOS-8 Division, Motorola, Austin, TX.

ENGINEERING CONSULTING SERVICES: 80 Companies (1991-present)

FUNDED RESEARCH PROJECTS: (from September 1990 to present): 135+ Projects as PI and Co-PI (over $75 million)
Research Funding at WPI: (8/1/15-10/31/23): $47 million.

PATENTS:
1. Production of electrolytic grade of iron-powder from sponge iron fines [co-inventors: R.R. Dash and S.K. Singh, National Metallurgical Laboratory], India, August 1990.
2. Abatement of PFC gases by molten aluminum. [co-inventors: G. DePinto and S. Dunnigan]: Motorola Corporation, September 1995.
3. A coating system for glass molding dies and forming tools. [co-inventors: JJ Moore and D. Zhong], Colorado School of Mines, February 2002.
4. Alumina-based thin film system for Aluminum die casting dies. [co-inventors: JJ Moore and S. Carrera] Colorado School of Mines, June 2002.
5. Removal of hard coatings by electrochemical technique, [co-inventors: JJ Moore and J. Matterson], Colorado School of Mines, June 2004.
6. Sensor Utilizing Thermoelectric Power for Measurement of Hydrogen Content in Metallic Hydride, [co-inventors: DL Olson and YD Park], Colorado School of Mines, October 2009 (applied for)
7. H. Obaid, David L. Olson and Brajendra. Mishra, "Long Chain Hydrocarbon Cracking Using Ultrasonic Waves", U. S. Patent Application # 61375345, EFSID: 8255798, August, 2010.
8. C. Stanton and B. Mishra, "Recovery of Samarium and Cobalt from Spent Sm-Co Permanent Magnets", U.S. Provisional patent Granted, March 2015.
9. M. Jung and B. Mishra, "Vanadium Recovery Methods", US Serial number 10,486,983, Worcester Polytechnic Institute, November 2019.
10. P. Eduafo, M. Strauss and B. Mishra, "Recovery of Mixed Rare-earth Oxides from Fluorescent Lamp Wastes", US Prov. Patent No. 62/431,553, Colorado School of Mines, February 2017.
11. S. Gostu and B. Mishra. "Hydrothermal methods for Processing Bauxite Residue", US Serial No. 16,213,243. Worcester Polytechnic Institute, February 2019.
12. H. Tanvar and B. Mishra, "Acid Wash of Red Mud (Bauxite Residue), U.S. Application No. PCT/US2021/62785, Worcester Polytechnic Institute, December 2020.
13. M. Sinha, J. Hiscocks, S. Das, B. Davis, B. Mishra, T. Grosko, and J. Pickens, "SELECTIVE REMOVAL OF IMPURITIES FROM MOLTEN ALUMINUM", U.S. Application No. 18/495,280, PCT/US23/77887, Worcester Polytechnic Institute (Phinix LLC.), November 2023.
14. S. Bergren, P. Kennedy, B. Mishra and H. Tanvar, "Wastewater treatment systems and methods using Calcined Bauxite Residue (CBR)", Application No. MT Ref.: 0264377.0001 [MTDMS-Legal.FID10040152], Gron, Inc., November 2023..

THESIS ADVISORY:
In Progress: Ph.D. 3 Post-doc. 5
Completed: M.S. 39 Ph.D. 49; Post-doc. 15

AWARDS:
1. Scholastic Excellence Award, 1981, IIT, India.
2. United States Bureau of Mines Fellowship, 1982-85.
3. Doctoral Dissertation Grant, Dow Chemical Corp, 1984.
4. University of Minnesota Doctoral Dissertation Award, 1985-86.

5. Computer Applications in Process Control, 1st Place Award, Tata Steel, 1990.
6. ASM Visiting Lectureship Award, 1992
7. TMS Light Metals Division Reactive Metals Award, 1998
8. ***Fellow: ASM International, 2004***
9. Best 2007 Congress Paper, North Amer. Die Casting Assoc., 2007
10. Honorary Membership, Indian Institute of Metals, 2008
11. Alexander Scott TMS Distinguished Service Award 2009
12. ***EPD-TMS Distinguished Lecturer, The Minerals, Metals & Materials Society 2013***
13. ***AIME Presidential Citation 2014***
14. Best Scientific Paper: World Resources Forum, Arequipa, Peru 2014
15. ***Fellow: TMS-AIME, 2016***
16. ***Kenneth Andrew Roe Award of AAES, 2016***
17. ***Distinguished Alumnus Award, Indian Institute of Technology, Kharagpur, 2017***
18. International Award of Materials Engineering for Resources, ICMR, Japan, 2017
19. Thermec 2018 Distinguished Award, Thermec, Paris, France, 2018
20. The Donald N. Zwiep Distinguished Fellow Award, WPI, 2023
21. LMD/EPD Best Paper Award in Recycling, TMS (with H. Tanvar), 2023.

HONORS:

1. Chairman: Extraction & Processing Division, TMS 2002-05
2. ***President: The Minerals, Metals and Materials Society, 2006***
3. President: Faculty Senate, Colorado School of Mines, 2006-07
4. ***President: American Inst. Of Mining, Metall. & Petroleum Engineers, 2007-2012***
5. Distinguished Lecturer: Govt. Center of Excellence, Tokyo, 2009
6. ***Distinguished Professor of Chemical Engineering, Petroleum Institute 2010***
7. Member, International Ship Structures Committee, 2010-2018.
8. Chair, Working Group on Advanced Surface Technology, TMS-DOE Panel
9. Honorary Professor, Kazakh National Technical University, Almaty 2012
10. 2013 Distinguished Lecturer, Education city, Doha, Qatar, 2013
11. Natl. Acad. of Science Panel Member on Energy Sustainability, 2012
12. EU-Japan-USA Trilateral FORUM Speaker on Critical Matls.: US DOE, Brussels 2013.
13. EU-Japan-USA Trilateral FORUM Speaker on Critical Materials: US DOE, Tokyo 2015.
14. ***University Emeritus Professor, Colorado School of Mines, 2015***
15. Member, Amer. Assoc. of Engineering Societies Board, 2017-2020.
16. Trustee, TMS Foundation Board, 2018-2020

MEMBERSHIP:

The Minerals, Metals and Materials Society of AIME
American Society for Materials International
National Association of Corrosion Engineers International
Society for Mining & Exploration Engineers

SERVICES:

Editorial Board: J. of High Temperature Chem. Processing, Japan
Editorial Board: Inst. of Metals J. on Mining & Metallurgy, UK
Editorial Advisory Board: OP Jindal Tech. Bulletin
Editorial Board: Kazakhstan J. for Mining & Metallurgy Associate
Editorial Board: Functional Composites and Structures Journal, KIM, Korea
Editorial Board: Minerals, MDPI Journal

Assoc. Editor: Journal of Sustainable Metallurgy
ASM Metals Handbook Review Board
ASM Engineered Materials Handbook Review
Board Metals & Materials Transactions Review Board [B]
Journal of Electrochem. Soc. Review Board
Journal of Materials Science & Engineering Review Committee
National Science Foundation Review Panels (PFI, SBIR/STTR and IUCRCs)

Research & Teaching Experience (1990 - present)

(A) Research guidance in chemical processing:

1. Calcium electrowinning from calcium oxide: Ph.D.
2. Cerium electrorefining by fused salt electrolysis: Ph.D.
3. Salt scrub reduction using combustion synthesized intermetallics (Post-doc)
4. Behavior of RCRA Constituents in pyrochemical processes (Post-doc)
5. Testing of Leaded Rubber Gloves: (Post-doc)
6. Washing technologies for cyanide contaminated substrates (Post-doc)
7. Recovery of value-added products from red-mud: M.S.
8. Removal of technetium from nickel and stainless steel: (Post-doc)
9. Electrolytic separation of uranium and magnesium by molten salt: (Post-doc)
10. Mineralogical investigation of perovskite phase in red-mud: M.S.
11. Recovery of iron and titanium from red-mud: Ph.D.
12. Electrochem. removal of nitride and carbide films for substrate reuse: (Post-doc)
13. Comparison of corrosion resistance of electroplated Chromium from Cr3+ vs. Cr6+ baths: M.S.
14. Synthesis of high strength bricks from fly-ash/red-mud composite mix: (post-doc)
15. Extraction of Oxygen from Lunar Regolith by Molten Salt Electrolysis: Ph.D.
16. Oxidation Kinetics Studies of Plutonium, Ph.D.
17. Evaluation of Titanium Extraction Processes by Molten Salt Electrolysis, M.S.
18. Developing a Pyrochemical Method to Produce Fuel Gas by Injection Water and Coal into Molten Steel. A Process called Supernova Process, M.S. (terminated).
19. Use of Lamb waves to assess the amount of carbide formation of the inner wall of a superalloy refinery pipes with external sensors, Ph.D.
20. Recovery of rare earth Metals from Phosphor Dust, M.S.
21. Recovery of Iron & Alumina from Red Mud, M.S.
22. Conversion to Metals and alloys from Oxides of Rare-earths by Molten Salt Electrolysis, Ph.D.
23. Recovery of valuable Metals from Waste Industrial Fines, PhD.
24. Recovery of Rare Earth Metals from Spent CFL Phosphor Dust, Ph.D.
25. Recovery of Lithium Phosphorus Fluoride Electrolyte from Spent Lithium Ion Batteries, MS.
26. Investigation of Chemical Processes for the Production of Commercially Viable High Volume Value-added Products from Bauxite Residue: Ph.D.
27. Recovery of Valuable Metals from Flue Dust and Other Fines from Mechanical Treatment of e-Scrap: (Post-doc)
28. Waste Water Treatment Sludge & High Value Grinding Swarf Recycling: (Post-doc)
29. Separation of Eu and Y from Phosphor Dust: Ph.D.
30. Recovery of Value-Added Products from Red Mud and Foundry Bag House Dust: Ph.D.
31. Hydrometallurgical Separation of Metal Oxides in Bauxite Residue: Ph.D. (ongoing)
32. Investigation of Copper Contamination in Steel Scrap: Ph.D.

33. Optimization of sorting and separation techniques for remanufacturing of product-centric recycled and reclaimed scrap: Ph.D.
34. Characterization and Beneficiation of Gold ore: Ph.D.
35. Optimization of Beneficiation and Extraction Techniques of Tantalite Ores: Ph.D.
36. Recovery of Electrolyte in Lead Acid batteries: Ph.D. (ongoing)
37. Filtration of Machining Fluid for Recycling: Ph.D. (ongoing)
38. Application of Treated Bauxite Residue for Water Purification: M.S. (ongoing)
39. Semi-solid casting of aluminum alloys for HPDC: Ph.D. (ongoing)
40. Separation of Terbium and Europium from Phosphor Dust: (Post-doc- ongoing)
41. Separation of Niobium from coated high strength steel substrates: (Post-doc-ongoing)
42. Scale-up of hydromet. process for magnetite recovery from bauxite residue: (Post-doc-ongoing)
43. Estimation of carbon-footprint in automotive parts recycling (Post-doc – ongoing)
44. Production of advanced Al-Cu-Li alloy from urban scrap reutilization (Post-doc – ongoing)
45. Recycling of scrap aluminum alloys by precipitation of impurity intermetallics (post-doc)

(B) <u>Research guidance in materials synthesis and PVD technology:</u>

1. Combustion synthesis of gallide intermetallics: M.S.
2. Development of oxidation resistant coatings for Mo-electrodes: Ph.D
3. Combustion synthesis of MoSi2-SiC layered intermetallic structures: M.S.
4. High strength glass-fiber reinforced steel composite: M.S.
5. Development of wear-resistant coating for tool steels: M.S.
6. Microstructural characterization of roll-bonded SS-alloy steels: M.S.
7. Development of hardfacing consumables: M.S.
8. Abatement of PFC gases using molten aluminum: M.S.
9. Development of Lithium anodes for thin film batteries: (Post-doc)
10. Development of coatings for optical lens dies: M.S.
11. Application of low-pressure plasma for wear resistant thin films: Ph.D.
12. Wetting properties of thin films for Al-pressure die casting dies: M.S.
13. Diagnostics of PVD plasma during TiN and TiO2 thin film deposition: Ph.D.
14. Development of self-lubricating graphite-TiC composite coatings: Ph.D.
15. Development of metal-carbide composite wear-resistant coatings: Ph.D.
16. Finite element modeling of fracture toughness in DLC coatings: Ph.D.
17. Development of multi-functional thin film coatings for Al-pressure casting dies: Ph.D.
18. Effect of sputtering parameters in ion-beam assisted deposition of c-BN: Ph.D.
19. Development of Coatings and Characterization based for Mo and W Refractory Metals, (Post-doc)
20. Vapor Deposition of Pd-Based Thin Films, Coolescence, (Post-doc)
21. Development of Coatings for High Performance Pump Components, (Post-doc)
22. Optical & Decorative Properties of Ultra-thin Films, (Post-doc)
23. Nanostructured, Multifunctional Cr-B-Al-N Coatings for Aerospace Applications, Ph.D.
24. Seebeck and magnetic behavior of Alanate hydrogen storage materials, M.S.
25. Optimization of AZ91 Magnesium Alloys for Automotive Applications, Ph.D.
26. Mechanical Testing of Uranium Alloys: Independent,
27. Underwater TEP Sensor to Assess H_2 in Nuclear Reactor Pressure Vessel Steel: Ph.D.
28. Uranium-Molybdenum alloy development, Ph.D.
29. Development of Uranium-Carbon Phase Diagram, M.S.
30. Development and calibration of SiC irradiation sensors, MS.
31. Development of uranium grain refinement by nucleation agents, Ph.D.

32. Case study of ACFM Non-destructive testing technique to measure crack lengths on structural members in service, M.S.
33. Case study of the use of NDE tools for assessment of residual strain in marine structures, M.S.
34. Development of Melting and Containment Crucible Materials for Uranium Processing, Ph.D.
35. Weldability of aluminum-beryllium alloys used in space components: (post-doc)
36. Residual Stress in Aluminum Casting: (post-doc)
37. Improvement of Impact Strength and Fracture Toughness through Chemically introduced Residual Stress: (MS)
38. In-situ Manufacturing Techniques for Al-Matrix Nano-composites: Ph.D.
39. Experimental investigation of in-situ microstructural transformations in wire arc additively manufactured Maraging 250-grade steel: Ph.D.
40. Design & Synthesis of a Novel Al-Cu-Li Alloy from Secondary Resource (Post-doc)

(C) <u>Research guidance in corrosion:</u>

1. Formation of iron carbonate scale on steel pipes: Ph.D.
2. Alternative techniques for Hydrogen-induced-cracking measurement: M.S.
3. Study of corrosion behavior of Ce as a surrogate for radioactive metals: M.S.
4. Development of corrosion-resistant coatings on stainless steel tube: M.S. (competed)
5. Corrosion of thin film magnetic media used in disk drives: M.S.
6. Corrosion effect on cleaning of type 304 SS with type D-721 solvents: M.S.
7. Effect of dessicants on corrosion of sheet steels in high humidity: post-doc
8. Development of corrosion resistant decorative thin film coatings: Ph.D.
9. Corrosion and magnetic properties measurement in Ni-Mg battery alloys: Ph.D
10. Effect of H2S on the corrosion of line pipe steels in brine solutions: Ph.D.
11. Effect of magnetic pigging of pipelines on hydrogen stress cracking susceptibility: Ph.D.
12. Study of oxidation Kinetics of plutonium: Ph.D.
13. Anodic Polarization effects on stress corrosion cracking of Inconel-600: Ph.D.
14. Electrodecon of Titanium Cleaning, Post-doc.
15. Develop Analytical Techniques to Assess Microbiological Corrosion and Identify the Organisms Involved, Ph.D
16. Assess the Hydrogen Content in Line Pipe with Electronic Measurement Techniques, TEP and Eddy Current Analysis, Ph.D.
17. Determine the Influence of the Magnetic Reminisce from Pigging Inspection of on the Hydrogen pick up and Solubility from Cathodic Protection on Line Pipe Steel, Ph.D.
18. Developing Advanced Methods to Non Destructively Sense for Potential Stress Corrosion Cracking Sites on Uranium Parts Using a Thermoelectric Power (Seebeck) Coefficient Surface Contact Probe, M.S.
19. Evaluation of Stress Corrosion Cracking Susceptibility of Inconel 600 under Anodic Polarization, Ph.D.
20. Development of Oxidation Resistant Thermal Barrier Coatings for MoSiB2 Turbine Material by Molten Salt Electrodeposition, Ph.D.
21. Effect of Pigging on Hydrogen Cracking Susceptibility in Linepipe Steels, Ph.D.
22. Extended Life Prediction Statistical Assessment and Mechanistic Interpretation of Corrosion in Double Hull Tankers, Res. Assoc.
23. Assess the Hydrogen Content in Line Pipe with Electronic Measurement Techniques, TEP and Eddy Current Analysis, Ph.D.
24. Materials Development and Characterization for Oil and Gas Exploration and Transport, MS.

25. Electrochemical Behavior of Titanium and its Alloys as Dental Implants in Normal Saline and Phosphate Buffer Solutions, Ph.D.
26. Investigation of Hydrogen Analysis Techniques in Zr-alloys, MS.
27. Microbiologically Influenced Corrosion Behavior of Carbon Linepipe Steels in Oil- Water Mixtures Characterized by Electrochemical Techniques, Post-Doc.
28. Characterization and Mechanistic Interpretation of MIC of Oil Linepipe Steels using rRNA Gene Sequencing, Post-Doc.
29. Effect of Concentration and Temperature of Ethanol in Fuel Blends on Microbial and Stress Corrosion Cracking on High-Strength Steel, PhD.
30. Corrosion Resistance Assessment of Tubulars and Cladded Tubulars for CO2, Acid Gas, and Sour Environments Associated with the Processing of Oil Shale: Ph.D.
31. Corrosion of Linepipe Steels under Alternating Current: Ph.D.
32. Assessment of Emerging Marine Corrosion and Wastage NDE Methodologies and Development of Marine Corrosion and Wastage Sensor, M.S.
33. Corrosion Behavior of Expanded Tubes in Harsh Environments, Ph.D.
34. Magnetic Field Effects on Microbiologically Influenced Corrosion by Sulfate Reducing Bacteria of Pipeline Steel, Ph.D.
35. Characterization of Microbes and their effect on Corrosion of Pipelines using DNA Sequencing, Ph.D.
36. Assessment of Emerging Marine Corrosion and Wastage NDE Methodologies and Development of Marine Corrosion and Wastage Sensor, M.S.
37. Developing Advanced Methods to Non-Destructively Sense for Potential Stress Corrosion Cracking Sites on Uranium Parts Using a Thermoelectric Power (Seebeck) Coefficient Surface Contact Probe", MS
38. Investigation of sour corrosion and cracks on structural materials for natural gas production, work will be performed at test facility in Qatar, M.S.
39. Eddy current testing with acoustic resonant enhancement to assist in characterizing steel microstructure, Ph.D.
40. Use of Lamb waves to assess the amount of carbide formation of the inner wall of a super-alloy refinery pipes with external sensors, Ph.D.
41. Effect of Pigging on Hydrogen Cracking Susceptibility in Linepipe Steels, Ph.D.
42. Optimization of AZ91 Magnesium Alloys for Automotive Applications, Ph.D.
43. Underwater TEP Sensor to Assess Hydrogen in Nuclear Reactor Pressure Vessel Steel, Ph.D.
44. Development of Advanced Austenitic Stainless Steels f or Down-hole Applications, Ph.D.
45. Development of High Interstitial Austenitic Stainless Steel for Drill Collar Application in Oil Exploration, Ph.D.
46. Development of Corrosion Resistance in Polymeric Coatings with Conductive Oxide Nanoparticles, Ph.D.
47. Assessment of Polymeric Pipes for Corrosion Resistance using NDE Methodologies, Ph.D.
48. Corrosion Behavior of Expanded Tubes in Harsh Environments, Ph.D.
49. Exfoliated Hexagonal Boron Nitride based Polymer Composite Coatings for Carbon Steel Protection in a Saline Environment: Ph.D.
50. Flow Accelerated Corrosion of the Heat Exchanger Carbon Steel Tubing in Air Cooled Condensers: Ph.D.
51. Phase Field Modeling of Galvanic Corrosion in Magnesium-aluminum Joints: Post-doc.
52. Galvanic Corrosion Studies of Al-Mg Friction Stir Welded Joints for Automotive Applications: Ph.D.

Teaching:

1. From Ore to Steel: Tata Steel Supervisory/Operation Staff, Jamshedpur, India, 1988.
2. Failure Modes and Effects Analysis: Motorola, MOS 8 and Plant Facilities Engineering Staff, Austin, TX, 1996.

Graduate/undergraduate courses at CSM:

1. Physical chemistry of iron and steelmaking (graduate & undergraduate) [MTGN 430/530]
2. Oxidation of metals (graduate) [MTGN 554]
3. Glass science and liquid oxide system (graduate) [MTGN 505]
4. Materials Selection and Design (undergraduate) [MTGN 466]
5. Engineering Materials Engineering (undergraduate) [MTGN 212/SYGN 202]
6. Introduction to Thermodynamics (undergraduate) [DCGN 209]
7. Advanced Topics in Corrosion (graduate & undergraduate) [MTGN 451/551]
8. Extractive Metallurgy for Non-Metallurgists [SPACE] [MTGN 598]
9. EPICS 201 and 251 (undergraduate)
10. Chemical Processing of materials (undergraduate) [MTGN 334]
11. Materials Processing and Design (undergraduate) [MTGN 465]

Graduate/undergraduate courses at the Petroleum Institute:

1. Materials Science (undergraduate) [MEEG 334]
2. Materials Engineering & Corrosion (graduate) [CHEG 575]

Graduate/undergraduate courses at the Worcester Polytechnic Institute:

1. Corrosion Science & Engineering (graduate) [MTE 594]
2. Chemical Processing of Materials (undergraduate) [ME 4832]
3. Introductory Materials Engineering (undergraduate) [ES 2001]
4. High Temperature Oxidation (graduate) [MTE 594]
5. Great Problems Seminar: Resource, Recovery & Reuse (undergraduate) [FY 1100]
6. Interactive Qualifying Project: International Project Center-Bangkok [IQP-BM2]
7. Interactive Qualifying Project: International Project Center-Hongkong [IQP-BM2]

PUBLICATIONS:

Refereed Publications in Journals:

1. B. Mishra and J.M. Sivertsen, "Electromigration of hydrogen and deuterium in tantalum: Isotope effect", Met. Trans., 14A, p.1255, [1983].
2. B. Mishra, A.K. Sinha and J.J. Moore, "Effect of single ageing on microstructure and impact strength of Inconel X-750", Met. Trans.16A, p 822, [1985].
3. B. Mishra and J.J. Moore, "Inconel X-750: Selection of heat treatment for PWR Applications", Scripta Met, 21(9), p 1179, [1987].
4. B. Mishra and J.J. Moore, "Effect of single-ageing on stress-corrosion cracking susceptibility of Inconel X-750 under PWR Conditions", Met. Trans., 19A, p 1295, [1988].
5. B. Mishra and J.J. Moore, "Effect of refining techniques on stress-corrosion cracking behavior of Inconel X-750, J. of Matl. Sc., 23(7), p 2294, [1988].
6. B. Mishra, S. Al-Hassan, D.L. Olson and M. Salama, "Physical characteristics of iron carbonate scale formation in linepipe steels", NACE Corrosion 92, p 13/1-13/11, NACE, Houston, TX, [1992].
7. S. Al-Hassan, B. Mishra and B.L. Olson, "Prediction of microstructural effect on corrosion of linepipe steels in CO2-brine solution", CORROSION 93, pp 90/1-90/13, NACE,

Houston TX, [1993].
8. B. Mishra and D.L. Olson, "Electrolytic Extraction of Beryllium", Mineral Processing and Extractive Metallurgy Review, Vol. 13, pp. 127-143, Gordon & Breach, UK, [1994].
9. B. Mishra, S.R. Pritchett and J.J. Moore, "Synthesis of calcium-gallium salt scrub reduction alloys and their efficiency in actinide recovery", J. Matl. Synthesis & Processing, 2(1), pp. 57-68, [1994].
10. B. Mishra and J.J. Moore, "Thermodynamic Estimation of ΔH for $CaGa_2$ Intermetallic", Met Trans, 25B, p. 151, [1994].
11. S. Govindarajan, J.J. Moore, B. Mishra and D. Olson, "Physical vapor deposition of molybdenum and silicon thin films", Surface & Coatings Technology, vol. 68/69, pp. 45-50, Elsevier Science S.A., [1994].
12. B. Mishra, D. Olson and S.A. David, "Post-weld electro-transport of hydrogen", J. of Materials Engineering and Performance, Vol. 3(5), pp. 612-618, [1994].
13. J.J. Moore, D.W. Readey, H.J. Feng, K. Monroe and B. Mishra, "The combustion synthesis of advanced materials", Journal of Metals, vol. 46 (11), p. 72-78, [1994].
14. B. Mishra, S.R. Pritchett and J.J. Moore, "Combustion synthesis of LiGa and LiAl intermetallic alloys", Met. & Matl. Trans B, Vol. 26B, pp. 121-134, [1995].
15. S. Govindarajan, B. Mishra, D. Olson, J.J. Moore and J. Disam, "Synthesis of MoSi2 on Mo substrates", Surface & Coatings Technology, 76-77, pp. 7-13, Elsevier Science SA, [1996].
16. W.K. Grant, C. Loomis, J.J. Moore, B. Mishra, D. Olson and A.J. Perry, "Characterization of hard chromium nitride coatings deposited by cathodic arc vapor deposition", Surface & Coatings Technology, vol. 86/87, pp. 788-796, Elsevier Science S.A., [1997].
17. S. Govindarajan, J.J. Moore, B. Mishra, D. Olson, T. Ohno and J. Disam, "On the possibility of tailoring a compositional gradient in thin films sputtered from a MoSi2 +X SiC composite target", Surface & Coatings Technology, vol. 86/87, pp. 33-40, Elsevier Science S.A., [1997].
18. S. Al-Hassan, B. Mishra, D. Olson, M.M. Salama, "Development of a predictive model for corrosion of steel in CO2-containing solutions", CORROSION, Vol 53 (11), pp. 852-59, [1997].
19. B. Mishra, A.G. Raraz, D. Olson and W.A. Averill, "Formation of explosive compounds in acid-contaminated leaded rubber gloves - Part I: Theoretical analysis", Journal of Hazardous Materials, Vol. 56, pp. 107-116, [1997].
20. B. Mishra, A.G. Raraz, D. Olson and W.A. Averill, "Formation of explosive compounds in acid-contaminated leaded rubber gloves - Part II: Experimental verification", Journal of Hazardous Materials, Vol. 56, pp. 117-128, [1997].
21. B. Mishra, G. DePinto, S. Dunnigan and K. Schwechel, "Effect of aluminum sputtering process parameters on the step-coverage in micro-electronic device manufacturing", J. of Electronic Materials, Vol 26 (4), pp. 376-382, [1997].
22. P.B. Ferro, B. Mishra, D. Olson and W.A. Averill, "Molten salt electrowinning of calcium", J. of waste Management, Vol 17(7), pp. 451-461, [1997].
23. B. Mishra, "The effective minimization and processing of nuclear wastes", Journal of Metal, Vol. 49(7), p.13, [1997].
24. P.B. Ferro, B. Mishra, D. Olson and W.A. Averill, "Electrolytic extraction of calcium", Golden Jubilee Issue of Trans. IIM, Vol 51(1), pp. 69-77, [1998].
25. S. Al-Hassan, B. Mishra, D. Olson, M.M. Salama, "Effect of microstructure on the corrosion of steels in CO2- containing aqueous solutions", CORROSION, Vol. 54(6), pp. 480-491, [1998].
26. R.L. Stephens and B. Mishra, "Waste treatment and recycling using pyrometallurgical

processes, J. of Metals, Vol. 50(7), pp. 20, [1998].
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91. B. Mishra, 'Critical Materials Recycling for Resource Sustainability', Presented at Amer. Inst. of Chem. Engineers Ann. Mtg., San Francisco, Nov. 3-6, 2013.
92. B. Mishra, 'Opportunities for Recycling of Critical Materials for Sustainability', Presented at the Third EU-US-Japan Trilateral Conference on Critical Materials: Towards New Models in Efficient Management of Critical Materials, Brussels, Belgium, May 29-30, 2013.
93. B. Mishra, 'Materials Manufacturing from Secondary Resources', 3rd Annual International Conference on Materials Science, Metal & Manufacturing (M3 2013), Bangkok, Thailand, September 9-10, 2013.
94. B. Mishra, 'Corrosion overview: Advanced Steels in the Oil & Gas Industry', Symp. On Advanced Materials and Reservoir Engineering for Extreme Oil & Gas Environments, 2013 TMS Annual Mtg., San Antonio, TX, March 11-15, 2013.
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98. Y. Xu; B. Mishra and S. Narra, “Effects of interlayer dwell time on microstructure of maraging steel 250 thin walls fabricated via wire arc additive manufacturing”, Annual TMS Meeting, Anaheim, CA, March 2022.
99. Q. Ding, B. Mishra, A.C. Powell and K. Karayagiz, “Cycling Corrosion Testing of Al-Mg Friction Stir Welded Bimetallic Joints,” 2021 TMS Annual Meeting (Virtual), March 2021.
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3. S. Govindarajan, Amit Chatterji and B. Mishra, "Physical and mathematical Modelling: experiences at Tata Steel" SCANHEAT, Lulea, Sweden, September 1988.
4. B. Mishra, R. Jha and S.K. Singh, "Development of marine corrosion resistant structural steel under Indian conditions", 42nd IIM Annual Meeting, New Delhi, India, November 1988.
5. B. Mishra, R. Jha and N. Gope, "Extra-deep drawing quality steel: Establishment of process parameters", 42nd IIM Annual Meeting, New Delhi, India, November 1988.
6. R. Dutta and B. Mishra, "Mathematical modelling of Corex Process: Relevance under Indian condition" 43rd IIM Annual Meeting, Calcutta, India, November 1989.
7. D.L. Olson, B. Mishra, J.J. Moore and W.A. Averill, "Optimization of process parameters for the electro-winning of calcium", 10th Pyrochemical Workshop, Charleston, SC, January 1991.
8. B. Mishra, D.L. Olson, J.J.Moore and C.A. Nannie, "Optimization of process parameters for the electro-refining of cerium", 10th Pyrochemical Workshop, Charleston, SC, January 1991.
9. J.J. Moore, B. Mishra, D.L. Olson, and A.M. Murray, "Combustion synthesis of intermetallic and ceramic materials and its application to the synthesis of gallium salt scrub reduction alloys", 10th Pyrochemical Workshop, Charleston, SC, January 1991.
10. W.A. Averill, D.L.Olson and B. Mishra, "Solubility studies of the calcium-calcium oxide/calcium chloride system", Molten Salt Chemical Technology Conference, France, July 1991.
11. B. Mishra, D.L.Olson, J.J.Moore and C.A.Nannie," Optimization of parameters in electrorefining of cerium", 30th Annual Conference of Metallurgists and 21st Annual Hydrometallurgical Meeting of CIM, Ottawa, Ontario, Canada, August 1991.
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31. B. Mishra, "Influence of Microstructure on the Corrosion of Linepipe Steels in a Carbon Dioxide Environment", 1993 DOE Corrosion Contractor"s Meeting, Colorado School of Mines, Golden, CO, September 15-17, 1993.
32. B. Mishra and W.A. Averill, "Behavior of RCRA Constituents in Waste Salt Treatment Processes", Molten Salt oxidation Processes, 13th Annual Pyrochemical Workshop, Albuquerque, NM, Oct 18-21, 1993.
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47. B. Mishra, "Development of Wear-resistant Thin Film Coatings by Physical Vapor deposition", Invited lecture, Indian Institute of Metals, Ranchi Chapter, MECON, Ranchi, India, December 14, 1998.
48. B. Mishra, "Applications of Molten Salts in Metals Production", Space Resources Roundtable, Colorado School of Mines, Golden Colorado, October 24-26, 2001.
49. B. Mishra, "Separation of Magnesium and uranium by Molten Salt Electrorefining", GS Ansell Chair Seminar Presentation, Dept. of Metallurgical & Materials Engineering, Colorado School of Mines, Golden, Colorado, October 29, 2001.
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66. B. Mishra, "Future Corrosion Issues in Oil & Gas Industry", Invited Lecture, Texas A&M

University at Qatar, Doha, Qatar, April 18, 2010.

67. B. Mishra, Presentations at Sungkyunkwan University, Seoul, KOGAS and Pusan National University, Pusan, Korea, July 18-22, 2010 on: Magnetization Effect on Hydrogen Induced Corrosion of Pipelines Sustainability through Recycling Advanced Coatings for Surface Engineering
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80. B. Mishra, "Corrosion Issues in Oil & Gas Production and Transport", Intl. Symp. On Corrosion & Protection – ISCP-2011, Pusan, S. Korea, January 2011.
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82. B. Mishra, "Advances in Magnetron Sputtering for Superior Surface Engineering", Distinguished Speaker Seminar at the Petroleum, Institute, Abu Dhabi, January 2011.
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Invited Seminar at the Texas A&M University at Qatar, Doha, Qatar, February 2011.

84. B. Mishra, "Engineering Solutions for Sustainability: Materials & Resources: Workshop Overview", Engineers Forum on Sustainability: ICOSE"11, ASME, Tuscon, AZ, Jan.2011.
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86. B. Mishra, "Extraction and Recovery of Rare-earth Metals: Challenges in Processing", Workshop on Geology to Metallurgy of Critical Rare-Earths, Camborne School of Mines, Falmouth, UK, March 2014.
87. B. Mishra, "Role of Critical Materials in Global Sustainability of Energy & Environment", Intl. Conference on Energy, Environment, Materials and Safety, Cochin University of Science & Technology, Cochin, India, December 11, 2014.
88. B. Mishra, "The Role of Materials Recycling in Economic Sustainability", Indian Institute of Science, Bangalore, India, December 4, 2014.
89. B. Mishra, "Critical Materials Recycling & Recovery", Invited lecture in World Resources Forum, Arequipa, Peru, October 22, 2014.
90. B. Mishra, "Rare Earth Metals: Research Opportunities", Rocky Mountain Chapter: Materials Research Society, Boulder, CO, November 17, 2104.
91. P. Eduafo, M. Strauss & B. Mishra, "Experimental Investigation of Recycling Rare Earth Metals from Fluorescent Lamp Phosphors ", TMS Poster Session, Orlando, FL, March 2015.
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94. B. Mishra, "ADVANCES IN LIGHTWEIGHT METAL PROCESSING FOR THE AUTOMOTIVE INDUSTRY", Presented to Korea Institute of Industrial Technology (KITECH), Busan, S. Korea, June 21, 2016.
95. B. Mishra, "RECYCLING OPPORTUNITIES IN CRITICAL METALS SUSTAINABILITY", Presented to Pusan National University, Busan, S. Korea, June 22, 2016.
96. B. Mishra, "MATERIALS SUSTAINABILITY THROUGH VALUE-ADDED PRODUCTS CONVERSION", Presented to Lawrence Livermore National Laboratory", Livermore, CA, May 2016.
97. B Mishra and M Jung, "Recovery of Aluminum from the Aluminum Smelter Baghouse Dust", TMS 2016, February 2016.
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Disassembly in Support of Materials Reuse", TMS 2018 Conference, Pheonix, AZ, [2018].

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104. Brajendra Mishra, "Recycling of Critical Metals: A Pathway to Materials Sustainability", Research Forum on the Recycling Technology of Rare-Metals, Nagoya University, Nagoya, Japan, May 25, 2017
105. Brajendra Mishra, "Recycling of Materials: Pathway to Materials Sustainability", Akita University, Akita, Japan, October 25, 2017.
106. Brajendra Mishra and Eunkyung Lee, "Wear and Corrosion Properties of High Interstitial Stainless Steels for Drilling Application in Sour Gas Well Environments", Euromat 2017, Thessaloniki, Greece, September 18 2017.
107. M. Strauss, B. Mishra & P. Eduafo, "Selective Reduction and Separation of Europium from Mixed Rare-earth Oxides from Waste Fluorescent Lamp Phosphors", Euromat 2017, Thessaloniki, Greece, September 18 2017.
108. J. Fedors, E. Lee and B. Mishra, "In-situ manufacturing techniques for aluminum matrix nano-composites", MS&T 2017 Pittsburgh, PA, October 11, 2017.
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