

University of Nevada, Reno

# Dr. Manoranjan Misra

## Curriculum Vitae

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## DR. MANORANJAN MISRA

Director, Renewable Energy Center  
Professor, Materials Engineering Division

Phone: (775) 784-1603

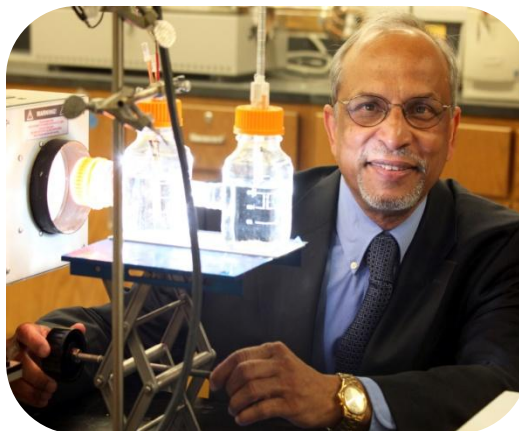
Fax: (775) 784-4949

Email: [misra@unr.edu](mailto:misra@unr.edu)

Webpage: [www.unr.edu/mse/misra](http://www.unr.edu/mse/misra)

Shipping Address:

1664 North Virginia Street MS 388  
Reno, NV 89557-0042, USA



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## EDUCATION

B. Sc. Chemistry, Utkal University, 1970

M. Sc. Chemistry, Regional Engineering College, 1972

M.S. Metallurgical Engineering, South Dakota School of Mines, 1977

Ph. D. Metallurgy, University of Utah, 1981

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## RESEARCH INTERESTS

Photoelectrochemical hydrogen generation;  
Hydrogen storage using CNT and titania composites;  
Materials for high temperature nuclear reactors;  
Nanotube and nanowire materials and devices  
Boron nitride nanotubes;  
Nanoporous materials;  
Second generation nuclear waste-package design;  
Corrosion of materials used in YMP;  
Radiation detectors;  
Arsenic removal;  
Recycling Spent Nuclear Fuel; and  
Biofuels: coffee grounds and nonfood materials

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## POSITIONS HELD

Professor, Department of Chemical and Metallurgical Engineering, University of Nevada, Reno (1993-present)

Chair, Metallurgical and Materials Engineering, University of Nevada, Reno (1999-2005)

Director, Center for Mineral Bioprocessing and Remediation (1996-present)

Faculty, Environmental Science and Engineering, University of Nevada, Reno (1994-present)

Faculty, Biomedical Engineering, University of Nevada, Reno (1998-present)

Associate Professor, Department of Chemical and Metallurgical Engineering, University of Nevada, Reno (1988-1993)

Research Engineer, Mineral Resources Institute and Assistant Professor, Mineral Engineering, University of Alabama, (1985-1988)

Research Assistant Professor, Department of Metallurgy, University of Utah (1981-1985)

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## AWARDS AND RECOGNITION

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2009 Donalds Reynolds Governors Cup Faculty Advisor Award

The Rudolf Gunnerman Silver State Award for Excellence in Science and Technology, 2003

Foundation Professor, University of Nevada, Reno, 1998-2001

Outstanding Researcher Award, University of Nevada, Reno, 1996

Mentor Professor Award, Senior Scholar Program, 1997 and 1998, University of Nevada Alumni Association

The Minerals, Metals and Materials Society, TMS, EPD Outstanding Service Award, 1993, 1994 and 1995

The Garr Cutler Energy Award, University of Utah, 1978

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## BOOKS

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Mineral Bioprocessing, 1991

Published by The Mineral, Metals and Materials Society, TMS, Warrendale, Pennsylvania.

Separation Processes, 1995

Published by The Mineral, Metals and Materials Society, TMS, Warrendale, Pennsylvania.

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## PATENTS

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PATENTS ISSUED:

1. Process for the Treatment of Metal-Containing Water and Recovery of Metals Therefrom, Patent No. 5,505,857. Assignee: Board of Regents UCCSN.

2. Process for Removal of Selenium and Arsenic from Aqueous Streams, Patent No. 5,603,838. Assignee: Board of Regents UCCSN (Technology has been licensed to EP Minerals & Filtration Inc).

3. Method of Removing Mercury from Solution, Patent No. 5,599,515, February, 1997.

Assignee: Board of

Regents UCCSN (Technology has been licensed to Cherokee Chemicals and is being used by 10 mining operations).

4. Process for Removal and Stabilization of Arsenic and Selenium from Aqueous Streams, U.S. Patent No. 9,124,815. Assignee: Board of Regents UCCSN (Technology has been licensed to EP Minerals and Filtration).

5. Cyanide Detoxification Process, U.S. Patent No. 6,551,514. Assignee: Board of Regents, UCCSN.

6. Process for Passivating Sulfidic Iron-Containing Rock, U.S. Patent No. 6,661,514. Assignee: Board of Regents, UCCSN.

7. Process for Separating High-Viscosity Bitumen from Utah Tar Sands, Patent No. 4,410,417 and 4,486,294. Assignee: University of Utah.

8. Coal Cleaning by Gaseous Carbon Dioxide Conditioning and Froth Flotation, Patent No. 4,676,804. Assignee: University of Utah.
9. Keratin Protein Adsorption of Heavy Metals, U.S. Patent No. 6,685,838, February 3, 2004. (Given to: Maxim Biosystems).

PATENTS PENDING:

1. Catalyzed Dissolution of Copper from Sulfur Containing Copper Minerals, Patent Pending, October 2002.
2. Removal of Arsenic from Drinking and Process Water, Patent Pending, (No 60/371773) April 2002.
3. Electrodeposition of Bioceramics on Nanoporous Titanium, Patent Pending, Filed July 2005.
4. Development of Methods and Devices for Photoelectrochemical Generation of Hydrogen using Hybrid Titanium Oxide Nanotubes, Patent Pending (11/735,965), Filed September 2006 (under negotiation for technology transfer).
5. Arsenic Absorbing and Methods of Different Compositions, Filed on April 16, 2007.
6. Method for Producing Biofuels from Coffee, Filed July 26, 2007 (under negotiation with various companies).
7. Biofuel Production Methods, Patent Pending, (11/971,377) Filed January, 2008 (under negotiation with Protein Biofuels Inc).
8. Nanostructured Array and Methods of use for Detection of Triacetone Triperoxide, provisional patent is being prepared by the attorney, 2008.
9. Preparation of Nano-Tubular Titania Substrate having Gold & Carbon particles deposited thereon and their use in Photo-Electrolysis of Water, Filed September 11, 2006.
10. Self-Ordered Arrays of Nanotubes of Titanium Oxide and Titania Oxide Alloys for Energy Storage, Filed December 12, 2007 (technology transfer is under discussion).
11. Deposit Methods and Coatings Produced using same, provisional filed on February 13, 2007 (60/889,647).

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## CURRENT FUNDED RESEARCH

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### Funded Research at the University of Nevada, Reno - Total Around 23 Million Dollars

Advanced Research and Development in Materials Reliability \$2,681,400 (expected date 10/01/08 – 09/30/11)

Photo-Electrochemical Generation of Hydrogen Using Semiconductor Titania Nanotubes, U.S. Dept. of Energy, \$3,047,250 (9/1/06-8/31/09)

Nuclear Materials, DOE-Advanced Fuels Cycle Initiative, \$990,000 (5/27/06-01/31/09)

Radioactive Contaminants in Water, DOE-NNSA, \$2,715,000 (10/1/05-9/30/08)

Fundamentals of Surface Reactions, DOE-EPSCoR, \$482,445 (8/1/06-7/31/09)

Yucca Mountain Corrosion-Task 14, DOE-ORD, \$1,396,759 (6/1/04-9/30/08)

Mass Balance of Mercury, Center for Advanced Separations, \$88,897 (7/26/06-9/30/08)

Nanotube and Nanowire R&D, DOE-Technology Development, \$966,475 (06/30/05- 09/30/08)

Environmental Effects on Corrosion Properties of Alloy 22, DOE-YMP, (\$3,571,974, 06/01/04-9/30/08)

Materials Evaluation, Degradation, and Modeling, Dept. of Energy Basic Science, \$744,000 (09/30/06-12/31/08)

## PREVIOUSLY FUNDED RESEARCH

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Nanoelectrode Arrays for Radiation Sensing, \$400,000  
Arsenic Removal Research, Eagle-Picher and ARI, \$173,492  
Pressurized Oxidative Process for Recovery of Energy from Biomass, \$620,000, Dept. of Energy – Energy Efficient  
Environmental Corrosion, Dept. of Energy – Civilian Radioactive Waste, \$845,000  
Nuclear Waste Repository Materials, DOE-Basic Sciences Division, \$966,000  
Nanomaterials and Devices, NSF-EPSCoR, \$116,110  
Hydrometallurgical Processing of Chalcopyrite, DOE - Center for Advanced Separation Technology, \$165,000 (Co-PI)  
New Reagent for Dolomite Processing, DOE - Center for Advanced Separation Technology, \$165,943 (Co- PI)  
NanoBlox Nano Diamond Effects on Electroplating of Copper for Semiconductor Interconnects, \$50,000  
Arsenic Filtration, Eagle-Picher, \$46,000, ARI \$46,000  
CFT Professorship \$24,000  
Acquisition of Transmission Electron Microscope for Materials Research, \$800,000, NSF (2003-2005) and UNR match \$600,000  
Hydrometallurgical Processing of Chalcopyrite, DOE-CAST, \$160,982  
Nanomaterials and Devices, NSF-EPSCoR, \$115,168  
Advanced Fuels Processing, \$45,000, Clean Fuels Technology  
Arsenic Filtration, Novation and ARI, \$32,000  
Solar Cells, Altair Nanomaterials and ARI, \$70,000  
Nanotechnology Research, First Nano and ARI, \$105,000  
Nanomaterials & Devices, NSF-EPSCoR, \$160,000  
Centrifugal Gravo-Magnetic Separation of Radionuclides from NTS Soil, \$111,526  
Innovative Technologies for Environmental Remediation: Technology Research, Inc., \$70,000  
Acid Rock Passivation, State of South Dakota and Hecla, \$17,500  
Research and Development of Emulsified Fuels, Clean Fuels Technology, \$240,000 and Applied Research Initiative (ARI), \$50,000  
Lab-Scale Testing of Passivation Technology for Newton Copper Mine, CAL-FED, \$60,000  
Passivation Technology for Gilt-Edge Operation, MSE Inc., \$13,000  
Industrial Consortium, \$20,000  
Centrifugal Gravo-Magnetic Separation, DOE, \$111,526  
Acid Rock Passivation, CalFed-EPA, \$60,000  
Keratin Protein for Environmental Application, Maxim, \$50,000  
Industrial Consortium, \$50,000  
Emulsified Fuels, Clean Fuel Technologies, \$110,000  
Innovative Technologies: Technologies Research, Inc., \$120,000 and ARI: \$50,000  
Centrifugal Gravo-Magnetic Separation (CGMS) Technology for Removal of Radionuclides from NTS Soil: DOE, \$111,526  
Remediation of Radium Contaminated Soil: EPA, \$172,727  
Thermo-Mechanical Properties of Nuclear Weapon Materials, Co-PI: DOE, \$150,000  
Biotechnological Processing: Geobiotics and ARI, \$125,000  
Acid Rock Passivation: Hecla and SD-DNER, \$17,500  
Cyanide Destruction: Hecla and ENVIRITE, \$20,000  
Precious Metal Recovery, Industrial Consortium, \$30,000  
Mixed Waste Remediation by Supercritical CO<sub>2</sub>, DOE, \$44,760  
Remediation of Radium Contaminated Soil, EPA, \$172,727

Barrier for Tritium, Radon and Other Isotopes, DOE \$60,000  
Biooxidation Pilot Plant, Geobiotics and ARI, \$110,000  
Novel Process for De-inking Office Waste Papers, Framatome Technologies and ARI, \$110,000  
Precious Metal Extraction, Industrial Consortium and ARI, \$110,000  
Thermal and Mechanical Properties of Nuclear Weapon Materials, DOE, \$780,000  
Remediation of Radium Contaminated Soil, EPA, \$172,727  
Johnston Atoll Remediation, OHM, \$20,000  
Mixed Waste Remediation, DOE, \$44,760  
Removal of Mercury, Newmont, \$28,000  
Arsenic Removal, Tech Metals and ARI \$110,000  
Biooxidation, Geobiotics and ARI, \$101,628  
Zinc Sulfate Process, Colonial, \$50,000  
Selective Removal of Mercury, USBM, \$136,000  
Removal of Oxyanions of Arsenic and Selenium, USBM, \$123,000  
Industrial Support, \$41,000  
Mixed Waste Remediation, DOE, \$44,760  
Selective Removal of Mercury, USBM, \$136,000  
Removal of Oxyanions of Arsenic and Selenium, \$123,000  
Biooxidation, Geobiotics, \$51,628  
Misc. Industrial Support, \$50,000  
Mine Waste Remediation, EPA-EPSCoR, \$201,000  
Characterization and Physical Separation of Radionuclides from NTS, DOE, \$201,174  
Phosphate Flotation: FIPR, \$69,300  
Mine Waste Remediation and Treatment, EPA-EPSCoR, \$201,000  
Mitigation of Acid Mine Drainage by Agglomeration and Encapsulation of Acid Mine Tailings, USBM, \$41,000  
Removal of Oxyanions of Selenium and Arsenic, USBM, \$123,000  
Selective Removal of Mercury from Gold Cyanide Circuits, USBM, \$136,000  
Characterization and Physical Separation of Radionuclides From NTS Contaminated Soils, DOE, \$61,436  
NTS Plutonium Stabilization, Martin Marietta, \$25,000  
Advanced Concepts in Mineral Processing, Industrial Consortium, \$54,000  
Characterization and Removal of Plutonium from Johnston Atol Coral Sand, DoD, \$88,000  
Heavy Metals Contaminated Soil, Soil Washing Operations, DOE, \$1,262,981  
Mitigation of Acid Mine Drainage by an Agglomeration and Encapsulation of Acid Mine Tailings, USBM, \$41,765  
Removal of Oxyanions of Selenium and Arsenic, USBM, \$61,000  
Selective Separation of Coal from Ash and Pyrite With a Novel Mycobacterium phlei, DOE, \$139,130  
Advanced Concepts in Mineral Processing, Industrial Consortium, \$50,475  
Plutonium Contaminated Soils, DOE, \$150,000  
Mitigation of Acid Mine Drainage by an Agglomeration-Encapsulation Process, USBM, \$51,577  
Advance Concepts in Mineral Processing, Industrial Consortium, \$50,000  
Selective Removal of Coal From Ash and Pyrite, DOE, \$139,130  
Soil Decontamination Research, DOE, \$50,000  
Mitigation of Acid Mine Drainage by Agglomeration-Encapsulation Process, USBM, \$51,577  
Flocculation of Kerogen with Hydrophobic Mycobacterium phlei, DOE, \$25,000  
Mineral Processing Conference, NSF, \$12,000  
Recovery of Tar Sands by Solvent Extraction, DOE, \$106,535  
Recovery of Tar Sands by Solvent Extraction Process, DOE, \$106,539  
Pressure Cycle Comminution of Eastern Oil Shale, DOE, \$61,459.

## PUBLICATIONS (TOTAL 175)

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1. T. Gandhi, K.S. Raja, **M. Misra**, I. Chatterjee, X. Luo and P. Dzurella, "Synthesis and Characterization of CZT Nanowire Arrays for Gamma Ray Detection," *International J. of Nanotechnology*, Vol. 5, No. 415, 2008, pp. 519-533.
2. T. Gandhi, K.S. Raja and **M. Misra**, "Room Temperature Electrodeposition of Aluminum Antimonide Compound Semiconductor," *Electrochimica Acta*, April 2008 (online).
3. S. Mohapatra, P. Das and **M. Misra**, "Photoelectrolysis of Water Using Heterostructural Composite of TiO<sub>2</sub> Nanotubes and Nanoparticles," Submitted to *Journal of Physical Chemistry*, April 2, 2008.
4. V. Mahajan, K.S. Raja and **M. Misra**, "Self Organized TiO<sub>2</sub> Nanotubular Arrays for Photoelectrochemical Hydrogen Generation: Effect of Crystallization and Defect Structures," Accepted to be published, *Journal of Physics, D, Applied Physics*, March 28, 2008.
5. Y. Sohn, Y. Smith, **M. Misra** and R. Subramanian, "Electrochemically Assisted Photocatalytic Degradation of Methyl Orange Using Anodized TiO<sub>2</sub> Nanotubes," Accepted to be published, *Journal of Applied Catalysis B*, March 2008.
6. S. Mohapatra, **M. Misra** et al., "Effect of Ethylene Glycol," Accepted in *Journal of Physical Chemistry*, 2008.
7. **M. Misra** and K.S. Raja, "High Capacity Photoelectrochemical Hydrogen Generation Using Hybridized Nanotubular Arrays of TiO<sub>2</sub> Photoanode and Cathode," Paper No 085, Proceedings of the ISFL Conference, New Delhi, March 2008.
8. P. Kar, K.S. Raja, **M. Misra** and B.N. Agasanapur, "Formation and Stability of Anatase Phase of Phosphate Incorporated and Carbon Doped Titania Nanotubes," Accepted to be published in *Scripta Materials*, March 2008.
9. **M. Misra**, S.K. Mohapatra, V. Mahajan, P. Das and K.S. Raja, "Production of Renewable Solar Hydrogen Using Nanotubular Semiconductor Heterostructures by Water Electrolysis," Proceedings of the Clean Tech Conference, Boston, June 1-3, 2008.
10. A. Mishra, K.S. Raja, O.A. Graeve and **M. Misra**, "Hydrogen Storage Capacity of Titania Nanotubes and TiO<sub>2</sub> Nanoparticles," to be submitted, *Materials Letter*, April 2008.
11. S.K. Mohapatra, V.K. Mahajan and **M. Misra**, "Double-side Illuminated Titania Nanotubes for High Volume Hydrogen Generation by Water Splitting," *Nanotechnology*, 18, 2007, pp. 1-6.
12. S.K. Mohapatra, **M. Misra**, V.K. Mahajan and K.S. Raja, "Design of a High Efficient Photoelectrolytic Cell of Hydrogen Generation by Water Splitting: Application of TiO<sub>2-x</sub>C<sub>x</sub> Nanotubes as Photoanode and Pt/TiO<sub>2</sub> Nanotubes as a Cathode," *J. Physical Chemistry C*, 111, 2007, pp. 8677-8685.
13. S.K. Mohapatra, **M. Misra**, V.K. Mahajan and K.S. Raja, "A Novel Method for the Synthesis of Titania Nanotubes Using Sono-electrochemical Method and Its Application for Photo-electrochemical Splitting of Water," *Journal of Catalysis*, Vol. 246, 2007, pp. 362-369.
14. S.K. Mohapatra and **M. Misra**, "Enhanced Photoelectrochemical Generation of Hydrogen from Water by 2,6-Dihydroxyanthraquinone-Functionalized Titanium Dioxide Nanotubes," *J. Physical Chemistry C*, 111, 2007, pp. 11506-11510.

15. K.S. Raja, **M. Misra**, V.K. Mahajan, T. Gandhi and P. Pillai, "Photo-electrochemical Hydrogen Generation Using Band-gap Modified Nanotubular Titania Oxide in Solar Light," *J. Power Sources*, Article in Press, 2007.
16. S.K. Mohapatra, **M. Misra**, V.K. Mahajan and K.S. Raja, "Synthesis of Y-Branched TiO<sub>2</sub> Nanotubes," *Materials Letters*, 2007, available online 5 October 2007.
17. S.K. Mohapatra, K.S. Raja, **M. Misra**, V.K. Mahajan and M. Ahmadian, "Synthesis of Self-Organized Mixed Oxide Nanotubes by Sonoelectrochemical Anodization of Ti-Mn Alloy," *Electrochimica Acta*, Article in Press, Available online at [www.sciencedirect.com](http://www.sciencedirect.com), 2007.
18. K.S. Raja, T. Gandhi and **M. Misra**, "Effect of Water Content of Ethylene Glycol as Electrolyte for Synthesis of Ordered Titania Nanotubes," *Electrochemistry Communications*, 9, 2007, pp. 1069-1076.
19. **M. Misra**, K. Paramguru and S.K. Mohapatra, "Growth of Carbon Nanotubes on Nanoporous Titania Templates," *J. Nanoscience & Nanotechnology*, Vol. 7, No. 8, 2007, pp. 2640-2646.
20. P. Kar, **M. Misra** and J.S. Armijo, "Design and Thermal Modeling of Radically Configured Nuclear Waste Package," *Annals of Nuclear Energy*, Article in Press, 2007.
21. S.K. Mohapatra, K.S. Raja, **M. Misra**, V.K. Mahajan and M. Ahmadian, "Synthesis of Self-Organized Mixed Oxide Nanotubes by Sonoelectrochemical Anodization of Ti-Mn Alloy," *Electrochimica Acta*, Article in Press, Available online at [www.sciencedirect.com](http://www.sciencedirect.com), 2007.
22. S.K. Mohapatra, **M. Misra**, V.K. Mahajan and K.S. Raja, "Synthesis of Y-Branched TiO<sub>2</sub> Nanotubes," *Materials Letters*, 2007, available online 5 October 2007.
23. **M. Misra**, K. Paramguru and S.K. Mohapatra, "Growth of Carbon Nanotubes on Nanoporous Titania Templates," *J. Nanoscience & Nanotechnology*, Vol. 7, No. 8, 2007, pp. 2640-2646.
24. K.S. Raja, **M. Misra**, V.K. Mahajan, T. Gandhi and P. Pillai, "Photo-electrochemical Hydrogen Generation using Band-gap Modified Nanotubular Titania Oxide in Solar Light," *J. Power Sources*, Article in Press, 2007.
25. K.S. Raja, V.K. Mahajan and **M. Misra**, "Determination of Photo-Conversion Efficiency of Nanotubular Titanium Dioxide Photo-Electrochemical Cell for Solar Hydrogen Generation," *Journal of Power Sources*, 159, 2006, pp. 1258-1265.
26. **M. Misra**, K.S. Raja, V.K. Mahajan and S.K. Mohapatra, "Photo-electrochemical Generation of Hydrogen Using Hybrid Titanium Dioxide Nanotubular Arrays," Invited Paper, *Solar Hydrogen and Nanotechnology*, Proceedings of SPIE, Vol. 6340, 2006, pp. 634001-11.
27. J.S. Armijo, P. Kar and **M. Misra**, "Second Generation Waste Package Design and Storage Concept for the Yucca Mountain Repository," *Journal of Nuclear Engineering and Design*, 236, 2006, pp. 2589-2598.
28. P. Pillai, K.S. Raja and **M. Misra**, "Electrochemical Storage of Hydrogen in Nanotubular TiO<sub>2</sub> Arrays," *J. of Power Sources*, Vol. 16, 2006, pp. 524-530.
29. **M. Misra**, K.S. Raja, V.K. Mahajan and S.K. Mohapatra, "Photo-electrochemical Generation of Hydrogen Using Hybrid Titanium Dioxide Nanotubular Arrays," Invited Paper, *Solar Hydrogen and Nanotechnology*, Proceedings of SPIE, Vol. 6340, 2006, pp. 634001-11.

30. P. Pillai, K.S. Raja and **M. Misra**, "Electrochemical Storage of Hydrogen in Nanotubular TiO<sub>2</sub> Arrays," *J. of Power Sources*, Vol. 16, 2006, pp. 524-530.
31. A. Kar, K.S. Raja and **M. Misra**, "Electrodeposition of Hydroxyapatite onto Nanotubular TiO<sub>2</sub> for Implant Applications," *Surface Coatings and Technology*, Vol. 201, 2006, pp. 3723-3731.
32. T. Gandhi, K.S. Raja and **M. Misra**, "Templated Growth of Cadmium Zinc-Telluride (CZT) Nanowires using Pulsed-Potential in Hot-Non-Aqueous Solutions," *Electrochimica Acta*, Vol. 51, 2006, pp. 5932-5942.
33. K.S. Raja, V.K. Mahajan and **M. Misra**, "Determination of Photo-Conversion Efficiency of Nanotubular Titanium Dioxide Photo-Electrochemical Cell for Solar Hydrogen Generation," *Journal of Power Sources*, 159, 2006, pp. 1258-1265.
34. S. Badwe, K. S. Raja and **M. Misra**, "A Study of Corrosion Behavior of Ni-22Cr-13Mo-3W Alloy under Hygroscopic Salt Deposits on Hot Surface," *Electrochimica Acta*, 51, 2006, pp. 5836-5844.
35. S. K. Mohapatra, T. Gandhi and **M. Misra**, "Al-Sb Nanowire Arrays for Radiation Detection," *TMS Proceedings on Sensor Materials*, March 2006.
36. P. Kar, G. Danko, J. S. Armijo and **M. Misra**, "Thermal Design of Alternative Boiling Water Reactor Spent Nuclear Fuel Package for the Proposed Yucca Mountain Repository," *Nuclear Technology*, Vol. 155, July 2006, pp. 1-15.
37. K.S. Raja, **M. Misra** and K. Paramguru, "Formation of Self-Ordered Nano-tubular Structure of Anodic Oxide Layer on Titanium," *Electrochimica Acta*, 51, 2005, pp. 154-164.
38. G.P. Sklar, K. Paramguru, **M. Misra** and J.C. LaCombe, "Pulsed Electrodeposition onto AAO Templates for CVD Growth of Carbon Nanotube Arrays," *Nanotechnology*, 16, 2005, pp. 1265-1271 [Noted as top 10% of the papers published by the Institute of Physics].
39. K.S. Raja, **M. Misra** and K. Paramguru, "Formation of Self-Ordered Nano-tubular Structure of Anodic Oxide Layer on Titanium," *Electrochimica Acta*, 51, 2005, pp. 154-164.
40. K.S. Raja, **M. Misra** and K. Paramguru, "Deposition of Calcium Phosphate Coating on Nano-tubular Anodized Titanium," *Materials Letters*, 59, 2005, pp. 2137-2141.
41. **M. Misra** and M.C. Fuerstenau, "Chalcopyrite Leaching at Moderate Temperature and Ambient Pressure in the Presence of Nanosize Silica," *Minerals Engineering*, Volume 8, No. 3, 2005.
42. R.S. Mc Grath, **M. Misra**, G.P. Sklar and J.C. LaCombe, "The Synthesis of Alumina Nanowires on the Surface of Porous Alumina Membrane," *Proceedings of the Materials Research Society*, March 2005.
43. **M. Misra**, K. Paramguru, P. Pillai, K.S. Raja, and G.P. Sklar, "Growth of Carbon Nanotubes on Anodized Titanium Dioxide Templates and Storage of Hydrogen in the Carbon Nanotubes and Nanotubular Titanic Assemblies," paper submitted to *Nature Materials* for publication, October 2005.
44. J.S. Armijo, P. Kar and **M. Misra**, "Second Generation Waste Package Design and Storage Concept for the Yucca Mountain Repository," submitted to be published in *American Nuclear Society Journal*, October 2005.

45. K.S. Raja, V.K. Mahajan and **M. Misra**, "Determination of Photo-Converters Efficiency of Nanotubular Titanium Oxide Photo-electrochemical Cell for Solar Hydrogen Generation," submitted for publication in Journal of Power Sources, October 2005.
46. J.S. Armijo, P. Kar and **M. Misra**, "Second Generation Waste Package Design and Operating Concept for Disposal of High Level Waste at the Yucca Mountain Repository," for the International Radioactive High Level Waste Management Conference, Las Vegas, NV, submitted October 2005.
47. P. Kar and **M. Misra**, "Use of Keratin Fiber for Separation of Heavy Metals from Water," J. of Chemical Technology and Biotechnology, Vol. 79 (11), pp. 1313-1319, 2004.
48. **M. Misra**, K. Narayanan and S. Chen, "Atomic Force Microscopy for Nanoscale Quantifications," Indian Journal of Metals, September 2004.
49. K.S. Raja, S.A. Namjoshi and **M. Misra**, "Improved Corrosion Resistance of Ni-22 Cr-13 Mo-4W Alloy 64 Surface Nanocrystallization," Materials Letters, June 2004.
50. **M. Misra**, K. Narayan and G. Priyadarshan, "Atomic Force Microscopy and Electrochemical Impedance Spectroscopic Techniques for Nanoscale-Quantifications in Metallurgical and Materials Processing Systems," Proceedings of the International Conference in Quantitative Approaches in Mineral Processing, QAMP 2003, Published by Allied Publishers, June 2003.
51. **M. Misra** and P. Lentz, "Nano-structured Lanthanum-Diatomaceous Earth (DE) Composites for Filtration of Arsenic from Drinking Water," Advances in Filtration and Separation Technology, 16, p. 563, 2003.
52. **M. Misra** and P. Kar, "Avian Keratin Protein Nano-fiber for Environmental Applications," Chapter in a book entitled *Natural Fibers, Plastics and Composites*, Editors: Norman Weston and Fred Wallenberger, August 2003, pp. 83-93.
53. **M. Misra** and S. Chen, "Select-Coat for Passivation of Acid Mine Drainage," Proceedings of the International Mineral Processing Technology, Goa, India, 2002.
54. **M. Misra**, P. Lan and A.M. Raichur, "Effect of Ultrasonic Treatment on the Flotation of Arsenopyrite," Minerals and Metallurgical Processing, SME, May 2002.
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## THESIS AND DISSERTATIONS COMPLETED

Name	Degree	Subject	Date
Fat-Kwong Tjong	M.S.	The Effect of Particle Size on Heat of Immersion of Bituminous High Volatile Coal	Jul. 1990
Swapan Kumar	M.S.	Dielectric Properties of Intrinsic Moisture and Flotability of Coals	Oct. 1991
Mark Paoli	M.S.(EE)	Pressure-Cycle Comminution	Aug. 1991
Shuzhong Chen	M.S.	Hydrophobic Bacteria <i>Mycobacterium phlei</i> as Flocculating Agent and Flotation Collector for Hematite	Aug. 1992
Xiaotong Su	M.S.	Prevention of Acid Mine Drainage by Agglomeration of Reactive Tailings with Selected Binders and Bactericides	Dec. 1994
Kang Yang	M.S.	Removal of Heavy Metal Ions From Acid Mine Drainage	Dec. 1994
Dave Kremer	M.S. (Geo)	Magnetic Separation of Radionuclides from NTS Soil	Dec. 1994
Puttanna S. Honagahelli	M.S.	Numerical Modelling and Microwave Heating of Refractory Gold Ores	Aug. 1994
Ashok M. Raichur	Ph.D.	Selective Flocculation and Separation of Fine Coal From Ash and Pyrite Using a Hydrophobic Bacterium	Dec. 1995
Kwado O. Adutwum	M.S.	Adsorption Mechanism of Oxyanions of Selenium onto Lanthanum Oxide and Gamma-Alumina	Dec. 1995
Samuel A. Davis	M.S.	Transport Model for the Adsorption of Selenium in Packed Bed and Bench Tests with Aluminum and Lanthanum Oxide	Dec. 1995
Deba C. Nayak	M.S.	Adsorption of Oxyanions of Selenium and Arsenic at Oxide/Water Interface	May 1995
Cheng-Dong Chai	M.S.	Characterization and Physical Separation of Plutonium From Contaminated Nevada Test Site (NTS) Soil	Dec. 1995
S. Chen	Ph.D.	Physical Separation and Stabilization of Plutonium Contaminated Soil	Jan. 1996
Jerry A. Lorengo	M.S.	The Removal of Mercury From Cyanide Leach Solutions Using Dithiocarbonate	Dec. 1996
Kang Yang	Ph.D.	Potassium Iodide Leaching of Gold	Aug. 1997

Joseph Nanor	M.S.	Removal and Stabilization of Arsenic	Sept. 1998
M. Martinovic	M.S.	Adsorption Mechanism of Gold Thiosulfate onto Activated Carbon	Aug. 1999
K. Narayanan	M.S.	Electrochemistry of Chalcopyrite Leaching	Aug. 1999
R. Mohansingh	M.S. (ChemE)	Adsorption of Gold Thiosulfate onto Activated Carbon	May 2000
G. Priyadarshan	M.S.	Stabilization and Removal of Cyanide	Dec. 2000
A. Rawat	M.S. (ChemE)	Adsorption of Arsenic onto Lanthanum Oxide	Dec. 2000
S. Chen	Ph.D.	Passivation of Acid Mine Tailings	Aug. 2001
P. Lan	Ph.D.	Flotation of Arsenopyrite	Aug. 2001
C. Richman	Ph.D.	Photocatalytic Leaching	Dec. 2001
P. Kar	M.S.	Keratin Protein for Environmental Applications	Aug. 2002
L. Parasa	M.S.	Global Positioning Systems	May 2003
J. Youssef-Azoury	M.S.	FTIR of Polymer and Asphalt	May 2003
B. Liu	Ph.D.	An Object Oriented Self-Learning Controller for Process Engineering	Aug. 2003

**S. Mohapatra, Post-doc**

**S. Banerjee, Post-doc**

K. Paramguru	M.S.	Growth of Carbon Nanotubes on Anodized Titanium by CVD	May 2005
P. Kar	Ph.D.	Design & Thermal Modeling of Nuclear Waste Package	May 2006
C. Hsieh	M.S.	Enhanced Growth of CNT on Titania & AAO	Aug. 2007
T. Gandhi	Ph.D.	Radiation Sensor	March 2008

## CURRENT GRADUATE STUDENTS

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B. Raj	M.S.	Surface Reaction Modeling
N. Raju	M.S.	PEC Hydrogen Generation
R. Tache	M.S.	Nuclear Materials Characterization
S. John	M.S.	Biodiesel Formation
Y. Sohn	M.S.	Photochemical Hydrogen Generation
R. Kondamudi	Ph.D.	High Quality Biodiesel from Ground Coffee
V. Mahajan	Ph.D.	Bandgap Engineering

## COLLABORATION WITH

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Dr. Carl Nesbitt, Research Associate Professor  
 Dr. K.S. Raja, Research Assistant Professor  
 Prof. K. Zhong, Visiting Professor  
 Mr. G. Priyadarshan, Research Associate  
 Dr. Y. Ashida, Research Associate

## INTERNATIONAL SYMPOSIUM ORGANIZED

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Indo-USA Workshop on Nuclear Materials (TBD in 2009)  
International Mineral Processing Technology, 2004  
International Emerging Technologies Conference, Metals Management in Paper and Pulp, 1997  
Separation Processes, TMS, 1995  
Electrochemistry Theory and Practice TMS 1994  
Aqueous Processing, TMS, 1992-93  
Mineral Bioprocessing, Engineering Foundation, 1991  
Advances in Fine Particle Processing, Fine Particle Society, FPS 1989  
Fine Particle Processing Fine Particle Society, FPS 1988  
Processing of Energy Minerals, Engineering Foundation, 1985

## PROFESSIONAL SOCIETY ACTIVITIES

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Organizing Committee of Emerging Technologies, Paper and Pulp, 1997  
Chairman, TMS Aqueous Processing Committee, 1992-94  
Vice Chairman, TMS Aqueous Processing Committee, 1991  
Member, EPD Executive Committee, TMS 1992-94  
Member, Student Affairs Committee, TMS, 1991-95  
Member, TMS/EPD Scholarship Committee, 1992  
Vice Chair, Education Committee, SME, 1994-95  
Member of Fine Particle Organizing Committee, 1988-91  
Chairman, Novel Concepts and Biotechnology, Fine Particle Society, 1990  
Organizer and Session Chairman of Fine Particle Processing International Symposium, Boston, 1989  
Session Chairman, Novel Processing in Hydrometallurgy, TMS, 1987  
Session Chairman, Processing of Energy Minerals, Engineering Foundation, 1985  
Session Chairman, TMS/EPD Session on Hydrometallurgy and Aqueous Processing Fundamentals, 1991  
Session Chairman, Biosorption Methods and Recovery, Symposium on Residues and Effluent, TMS, 1992  
Session Chairman, Aqueous Processing, TMS, 1992  
Editorial Board of Fine Particle Processing Journal  
Organizational Committee of 1992 Eastern Oil Shale

## REVIEWER FOR JOURNALS

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The Mineral and Metallurgical Processing  
The International Journal of Mineral Processing  
Fuels Processing Technology  
Metallurgical Transaction  
Fine Particle Processing  
Energy Sources  
Hazardous Materials Journal  
Minerals Engineering

Separation Processes  
Nature  
Chemical Engineering Progress  
Science

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## REVIEWER FOR PROPOSALS

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Department of Energy-Alternate Energy  
Department of Energy-SBIR  
Department of Energy-Basic Science Division  
Idaho State Board of Education  
NSF  
EPA-EPSCoR  
DoD

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## SCIENTIFIC AND PROFESSIONAL SOCIETIES

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American Institute of Mining, Metallurgical and Petroleum Engineers  
American Chemical Society  
Fine Particle Society  
Sigma Xi  
American Institute of Chemical Engineers  
The Minerals, Metals and Materials Society, TMS  
American Ceramic Society

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## UNIVERSITY OF NEVADA, RENO COMMITTEES

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Faculty Senate Representative from College of Engineering – 2007-2009  
Member, Mackay School of Mines Personnel Committee - 1994-1996, 1998-Present  
Chair, Mackay School of Mines, Personnel Committee - 1995  
Chair, Departmental Chair Search Committee - 1996  
Environmental Science and Engineering Facility Committee - 1995  
Leadership Conference Committee - 1995  
Chemical and Metallurgical Engineering Departmental Personnel Committee - 1993-1995  
Chair, Departmental Personnel Committee - 1994  
Chair, Graduate Program, Metallurgical Engineering - 1993-95, 1999-2001  
University Environmental Facility Planning Committee, 1995  
Outstanding Research Award Committee, 1997-2002  
Foundation Professor Selection Committee, 2000  
Chair, Outstanding Researcher Award Committee, 2001

## TECHNOLOGY TRANSFER

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Newmont Mining / Cherokee Chemical Co. - Hg Stabilization  
Technical Metals - Arsenic Removal  
Geobiotics - Biooxidation of Gold Ores  
Framatome - Magnetic Separation  
Midas Gold - Selenium Removal  
Iron Mountain - Acid Mine Drainage  
Santa Fe - Hg Removal  
Clear Water Filtration System - As in Home Drinking Water  
Global Technologies - As in Water Purification  
Maxim Biosystem - Biofilters  
Eagle Picher Minerals – Arsenic Removal  
Bioceramics – Multiple companies