HODA AMANI HAMEDANI

Department of Materials Science and Engineering
Case Western Reserve University,
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EDUCATION:

Ph.D. in Materials Science & Engineering, Georgia Institute of Technology, Atlanta, GA Jan 2009 – Aug 2013

M.S. in Mechanical Engineering, Georgia Institute of Technology, Atlanta, GA Jan 2007 – Dec 2008

B.S. in Metallurgy and Materials Science (Ceramics Engineering), Iran University of Science & Technology, Tehran, Iran Sep 2000 – Jan 2005

PROFESSIONAL EXPERIENCE:

Research Fellow, Louis Stokes Cleveland Department of Veteran's Affairs Medical Center, Advanced Platform Technology (APT) Center, Cleveland, OH 2021 – Present

Senior Research Associate, Department of Materials Science & Engineering (DMSE), Case Western Reserve University (CWRU), Cleveland, OH 2019 – Present

Senior Materials Scientist, Nano Precision Medical Inc., Emeryville, CA 2017 – 2019

Visiting Scholar, School of Medicine, Stanford University, Stanford, CA 2016 – 2018

Materials Scientist, Nano Precision Medical Inc., Emeryville, CA 2016 – 2017

Postdoctoral Research Affiliate, School of Materials Science & Engineering (MSE), Georgia Institute of Technology, Atlanta, GA 2013 – 2016

Graduate Student Research Assistant, Laboratory of Micromechanics of Materials (LMM), Georgia Institute of Technology, Atlanta, GA 2007 – 2013

RESEARCH INTERESTS:

Nano/biomaterials, multifunctional materials for implantable electrochemical microdevices, drug delivery, neural interfacing, electrochemical energy conversion, photoelectrochemical water splitting, solid oxide fuel cells, nanomaterials synthesis and characterization, inorganic materials and electrochemistry.

HONORS, AWARDS, AND RECOGNITIONS:

- NSF Grant for Roadmap Workshop at Texas A&M ADVANCE Center, College Station, TX 2016
  (Selected among the top 50 candidates nationwide to participate in a workshop designed to help female junior faculty members and postdoctoral associates in STEM to be successful in academia)
- Paper selected for the Frontispiece of Advanced Functional Materials November 2014 Edition 2014
- Recipient of Materials Society Travel Grant for The Minerals, Metals & Materials Society (TMS) Annual Meeting and Exhibition, San Diego, CA 2012
- Best Junior Researcher Award**,** The Minerals, Metals & Materials Society (TMS) Annual Meeting and Exhibition, San Diego, CA 2011
- Finalist in the Science as Art competition at the 2011 MRS Spring Meeting 2011
- Georgia Tech College of Engineering and Student Government Association Travel Award 2011

PROFESSIONAL ACTIVITIES:

Technical Reviewer

- Review Editor of Frontiers in Materials, for "*Smart Materials*"
- Invited Reviewer for
  - *ACS Applied Materials & Interfaces*
  - *Journal of Power Sources*
  - *Fuel Cells*
  - *ChemSusChem*
  - *ASME 2012 International Mechanical Engineering Congress & Exposition (IMECE) conference*

Professional Memberships

- Materials Research Society (MRS)
- American Chemical Society (ACS)

PUBLICATIONS/PRESENTATIONS

H-Index: 10
i10-Index: 10

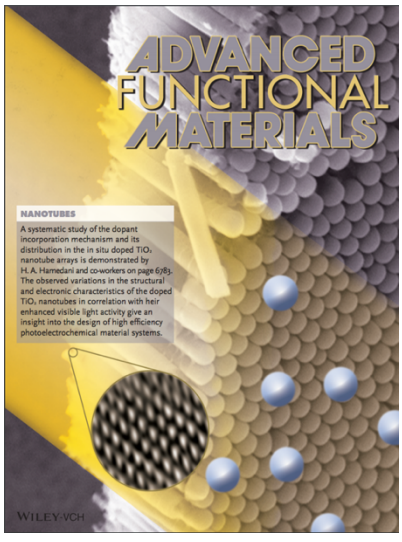
Refereed Journal Publications – Published

[J11] D. Khudhair, **H. Amani Hamedani**, J. Gaburro, S. Shafei, S. Nahavandi, H. Garmestani, A. Bhatti, "Enhancement of Electro-Chemical Properties of TiO_2 Nanotubes for Biological Interfacing", *Mater. Sci. Eng. C*, vol. 77, 111-120, 2017.

[J10] D. Khudhair, A. Bhatti, Y. Li, **H. Amani Hamedani**, H. Garmestani, P. Hodgson and, S. Nahavandi, "Anodization Parameters Influencing the Morphology and Electrical Properties of TiO_2 Nanotubes for Living Cell Interfacing and Investigations", *Mater. Sci. Eng. C Mater. Biol. Appl.*, vol. 59, 1125–1142, 2016.

[J9] **H. A. Hamedani**, N. K. Allam, M. A. El-Sayed, M. Khaleel, H. Garmestani and F. M. Alamgir, "An Experimental Insight into the Structural and Electronic Characteristics of Strontium-Doped Titanium Dioxide Nanotube Arrays", *Adv. Funct. Mater.*, vol. 24, 6783–6796, 2014.

[J8] **H. A. Hamedani**, J. Khaleel, K. H. Dahmen and H. Garmestani, "Surface Controlled Growth of Thin-Film Strontium Titanate Nanotube Arrays on Silicon", *Cryst. Growth Des.*, vol. 14, 4911–4919, 2014.



[J7] **H. A. Hamedani**, M. Baniassadi, A, Sheidaei, A, Ghazavizadeh, F. Pourboghrat, Y. Rémond, M. Khaleel and H. Garmestani, "Three-Dimensional Reconstruction and Microstructure Modeling of Porosity-Graded Cathode Using Focused Ion Beam and Homogenization Techniques", *Fuel Cells*, vol. 14, 91–95, 2014.

[J6] **H. A. Hamedani**, S. Lee, A. Alsammarraie, Z. R. Hesabi, A. Bhatti, F. Alamgir, H. Garmestani and M. Khaleel, "Synthesis and Growth Mechanism of Thin-Film TiO_2 Nanotube Arrays on Focused-Ion-Beam Micropatterned 3D Isolated Regions of Titanium on Silicon", *ACS Appl. Mater. Interfaces,* vol. 5, 9026–9033, 2013.

[J5] M. Baniassadi, B. Mortazavi, **H. A. Hamedani**, H. Garmestani, S. Ahzi, M. Fathi, M. Khaleel, D. Ruch, "Three-dimensional reconstruction and homogenization of heterogeneous materials using statistical correlation functions and FEM", *Comp. Mater. Science,* vol. 51, 372–379, 2012.

[J4] **H. A. Hamedani**, M. Baniassadi, M. Khaleel, X. Sun, S. Ahzi, D. Ruch and H. Garmestani, "Microstructure, Property and Processing Relation in Gradient porous Cathode of Solid Oxide Fuel Cells Using Statistical Continuum Mechanics", *J. Power Sources,* vol. 196, 6325–6331, 2011.

[J3] **H. A. Hamedani**, N. K. Allam, H. Garmestani, M. A. El-Sayed, "Electrochemical Fabrication of Strontium-Doped TiO_2 Nanotube Array Electrodes and Investigation of Their Photoelectrochemical Properties", *J. Phys. Chem. C,* vol. 115, 13480–13486, 2011.

[J2] **H. A. Hamedani**, K. H. Dahmen, D. Li, H. Peydaye-Saheli, H. Garmestani and M. Khaleel, "Fabrication of gradient porous LSM cathode by optimizing deposition parameters in ultrasonic spray pyrolysis", *Mat. Sci. Eng. B,* vol. 153, 1–9, 2008.

[J1] H. Baradari, **H. Amani Hamedani**, S. Karimi, H. R. Rezaie, J. Javadpour, H. Sarpoolaky, "The effect of materials concentration on hydroxyapatite powder characteristics and sintering behavior", *IJMSE*, vol. 1, 9–15, 2006.

Refereed Conference Publications – Published

[C4] **H. A. Hamedani**, Nageh K. Allam, Hamid Garmestani and Mostafa A. El-Sayed, "Anodically Fabricated Sr-doped TiO_2 Nanotube Arrays for Photoelectrochemical Water Splitting Applications", *MRS Online Proceedings Library,* Volume 1352, pp. 151-155, 2011.

[C3] K. L. Bhamidipati, **H. A. Hamedani**, S. Strauss, T. A. L. Harris, "Numerical Simulation of an Innovative PEM Fuel Cell Stack", presented at *ASME's 6th International Fuel Cell Science, Engineering & Technology Conference,* pp. 267-274, 2008.

[C2] **H. A. Hamedani**, K. H. Dahmen, D. Li, H. Garmestani, "Effect of Spray Parameters on the Microstructure of $La_{1-x}Sr_xMnO_3$ Cathode Prepared by Spray Pyrolysis", *Ceramic Engineering and Science Proceedings,* Vol. 29, Issue 5, pp. 139-145, 2008.

[C1] **H. A. Hamedani**, H. Baradari, S. Karimi, H. Rezaie, J. Javadpour, "Influence of Sintering Conditions on the Microstructure of Chemically Precipitated Hydroxyapatite Nanopowder", *Ceramic Engineering and Science Proceedings*, Volume 29, Issue 7, pp. 93-102, 2008.

Conference/Workshop Presentations

[P15] B. Chen, K. Edgehouse, D. Klaiber, **H. A. Hamedani**, E. Pentzer, B. Gurkan, "Synthesis and Characterization Methods for Deep Eutectic Solvents", poster presentation at *BEES-EFRC All Hands Meeting*, *Mar. 27-28, 2019, Cleveland, OH.*

[P14] **H. A. Hamedani**, J. Khaleel, K. H. Dahmen, H. Garmestani "Self-Assembled $SrTiO_3$ Nanostructured Arrays: Fabrication and Characterization", poster presentation at *MRS Spring Meeting, Apr. 1-5, 2013, San Francisco, CA.*

[P13] **H. A. Hamedani**, S. W. Lee, F. M. Alamgir, H. Garmestani, M. A. Khaleel, "Self-Organized TiO_2 Nanotube Thin-Films Grown on Silicon and Glass Substrates", oral presentation at *MRS Fall Meeting, Nov. 25-30, 2012, Boston, MA.*

[P12] **H. A. Hamedani**, S. W. Lee, K. H. Dahmen, F. M. Alamgir, H. Garmestani, M. A. Khaleel, "Hetero-Nanostructured One-Dimensional Electrolyte Membranes on Silicon: Fabrication, Characterization and Application for Micro-Solid Oxide Fuel Cells"", oral presentation at *MRS Fall Meeting, Nov. 25-30, 2012, Boston, MA.*

[P11] **H. A. Hamedani**, K. H. Dahmen and H. Garmestani, "Development of Novel Nanostructured Electrolytes for Low Temperature Solid Oxide Fuel Cells Applications", oral presentation at *TMS 2012 conference*, *Mar. 11-15, 2012, Orlando, FL.*

[P10] **H. A. Hamedani**, N. K. Allam, M. A. El-Sayed and H. Garmestani, "Doping and Decoration of Vertically Oriented TiO_2 Nanotubes for Solar Energy Applications", presented at *Georgia Tech Research and Innovation Conference, Feb. 2012, Atlanta, GA.*

[P9] **H. A. Hamedani**, K. H. Dahmen and H. Garmestani "In-situ Strain Measurements and its influence on Ionic Conductivity in Hetero- nanostructured Electrolytes of Solid Oxide Fuel Cells", oral presentation at *MRS Fall Meeting, Nov. 28-Dec. 2, 2011, Boston, MA.*

[P8] **H. A. Hamedani**, N. K. Allam, H. Garmestani and Mostafa A. El-Sayed, "Efficient Photoanode Architecture for Photoassisted Water Splitting: Doping versus Decoration of Wide Bandgap Semiconductor Materials", oral presentation at *MRS Fall Meeting, Nov. 28-Dec. 2, 2011, Boston, MA.*

[P7] **H. A. Hamedani**, N. K. Allam, H. Garmestani, "In-Situ Decoration and Doping of TiO_2 Nanotube Arrays", oral presentation at the *NanoTech Conference, June 2011*, *Boston, MA*.

[P6] **H. A. Hamedani**, N. K. Allam, H. Garmestani, "Anodically Fabricated Sr-doped TiO_2 Nanotube Arrays for Photoelectrochemical Water Splitting Applications", oral presentation at *MRS Spring Meeting, Apr. 25-29, 2011, San Francisco, CA.*

[P5] **H. A. Hamedani**, N. K. Allam, H. Garmestani, "Synthesis and Characterization of Vertically Oriented Sr-doped TiO_2 Nanotubes Using Electrochemical Anodization Process", presented at *TMS 2011 conference*, *Feb. 2011, San Diego, CA.*

[P4] **H. A. Hamedani**, N. K. Allam, M. A. El-Sayed and Hamid Garmestani, "In-situ Synthesis of Self-Organized Strontium-Doped Titania Nanotubes Arrays for Photoelectrochemical Applications", presented at *Georgia Tech Research and Innovation Conference, Feb. 2011, Atlanta, GA.*

[P3] K. L. Bhamidipati, **H. A. Hamedani**, S. Strauss, T. A. L. Harris, "Numerical Simulation of an Innovative PEM Fuel Cell Stack", presented at *ASME's 6th International Fuel Cell Science, Engineering & Technology Conference, June 16–18, 2008, Denver, Colorado.*

[P2] **H. A. Hamedani**, K. H. Dahmen, D. Li, H. Garmestani, "Effect of Spray Parameters on the Microstructure of $La_{1-x}Sr_xMnO_3$ Cathode Prepared by Spray Pyrolysis", oral presentation at *32nd International Conference and Exposition on Advanced Ceramics and Composites*, *Jan. 27-Feb. 1, 2008, Daytona Beach, FL.*

[P1] **H. A. Hamedani**, H. Baradari, S. Karimi, H. Rezaie, J. Javadpour, "Influence of Sintering Conditions on the Microstructure of Chemically Precipitated Hydroxyapatite Nanopowder", oral presentation at *32nd International Conference and Exposition on Advanced Ceramics and Composites*, *Jan. 27-Feb. 1, 2008, Daytona Beach, FL.*

Invited Presentations (Seminars, Workshops)

[IP4] **H. A. Hamedani**, "Multifunctional Nanomaterials: Tailoring Atomistic Properties for Complex Functions in Biomedical Devices", *Advanced Platform Technology Center (APTC)*, Jan. 2021.
[IP3] **H. A. Hamedani**, "Hetero-Nanostructures: Enabling Future Electrochemical Energy Harvesters", *Case Western Reserve University*, Mar. 2019.
[IP2] **H. A. Hamedani**, "Hetero-Nanostructures: The Future of Electrochemical Energy Conversion Devices", *University of Cincinnati*, Mar. 2018.
[IP1] **H. A. Hamedani**, "Implantable Integrated Bio-Fuel Cells for Self-Powered Medical Devices", *Stanford University*, Oct. 2017.

GRANTS AND FUNDING:

VA APT SG IIP	Role: Co-PI	$25,000	12/1/2020 – 11/30/2021
Flexible Neural Electrodes for In Vivo Neural Recording and Drug Delivery			
Cleveland Foundation	Role: PI	$17,820	1/1/2021 – 12/31/2021
Integrated Microfuel Cells for Low-Power Medical Implants and Biosensors			

ACADEMIC TEACHING AND MENTORING

- EMSE 102: Materials for Current and Future Technologies — Spring 2021
    - Lecture on Biomedical Materials
    - Lecture on Advanced Multifunctional Materials
- Thesis Committees for 1 MS students; MS Students: Current: 4; UG research mentees: Current: 3