

## CURRICULUM VITAE – March 2012

Teddy (Tewodros) Asefa

Associate Professor, Department of Chemistry and Chemical Biology  
Associate Professor, Department of Chemical and Biochemical Engineering  
Interim Director, The Rutgers Catalysis Research Center (RCRC)  
Member, Institute for Advanced Materials, Devices and Nanotechnology (IAMDN)  
Member, The Rutgers Energy Institute (REI)  
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### Research Interests:

Nanoscience and nanotechnology; inorganic materials chemistry; nanocatalysts and nanocatalysis; nanomedicine and targeted treatment of cancer; shaped nanoparticles and their self-assembly; nanoporous materials; nanoelectronics; nanomaterials for solar cells and renewable energy; inorganic-organic nanocomposites; and nanobiomaterials. Enjoys challenging and collaborative research.

### Education:

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| Post-doctoral | Chemistry, McGill University, Canada; 12/2002 – 5/2005<br>Advisor: Prof. R. Bruce Lennox<br>Project: Metal and semiconductor nanoparticles synthesis through electroless and chemical vapor deposition in porous matrices and on nanopatterned substrates                                     |
| Post-doctoral | Chemistry, University of Toronto, Canada; 8/2002 – 12/2002<br>Advisor: Prof. Geoffrey A. Ozin<br>Project: Functionalization of nanoporous materials <i>via</i> high temperature vapor phase reactions   |
| Ph.D.         | Chemistry, University of Toronto, Canada; 9/1998 – 8/2002<br>Advisor: Prof. Geoffrey A. Ozin<br>Dissertation: Periodic Mesoporous Organosilicas - A New Class of Hybrid Organic-Inorganic Nanocomposites  |
| M.A.          | Chemistry, State University of New York at Buffalo & Institute for Lasers, Photonics & Biophotonics, Buffalo, USA; 9/1996 – 9/1998<br>Advisor: Prof. Paras N. Prasad<br>Dissertation: Nanostructured Materials for Photonics  |
| B.Sc          | Chemistry, Distinction, Addis Ababa University, Ethiopia; 10/1988-8/1992<br>Advisor: Prof. Dirshaye Menberu<br>Research Report: Organic natural products - Isolation and Characterization of Anthochlor Flavonoids from the Flowers of <i>Bidens Prestinaria</i> and <i>Bidens Macroptera</i> |

**Employment and Research Experience:**

- 09/2009 – Date - Associate Professor of Chemistry and Chemical Biology, Rutgers, The State University of New Jersey at New Brunswick
- 09/2009 – Date - Associate Professor of Chemical and Biochemical Engineering, Rutgers, The State University of New Jersey at New Brunswick
- 09/2009 – Date - Member, The Rutgers Institute for Materials, Devices, and Nanotechnology (IAMDN)
- 09/2009 – Date - Member, The Rutgers Energy Institute (REI)
- 12/2009 – Date - Interim Director, The Rutgers Catalysis Research Center (RCRC)
- 03/2011 – Date - Vice-President, Sigma Xi Rutgers Chapter for Faculty and Professional Engineers
- 06/2005 – 08/2009 - Assistant Professor of Chemistry and Biochemistry, Syracuse University
- 01/2007 – 08/2009 - Member of the Syracuse Biomaterials Institute (SBI)
- 01/2007 – 04/2009 - Taught General Chemistry Part II, science majors (>320 Students)
- 09/2006 – 12/2007 - Taught Graduate Course, Materials Chemistry / Nanotechnology (5 Students)
- 09/2006 – 12/2008 - Taught Honors General Chemistry Laboratory (35 Students)
- 09/2005 – 12/2006 - Taught General Chemistry Course for non-science majors (80 Students)
- 01/2006 – 04/2006 - Taught General Chemistry Laboratory (400 students)
- 01/2006 – 09/2007 - Panel, Graduate Record Examinations (GRE) Subject test in Chemistry, Educational Testing Service (ETS), Princeton, NJ
- 10/2003 – 11/2004 - Guest Lecturer in Nanoscience and Nanotechnology course, McGill University, Canada (two years)
- 11/2004 – 11/2004 - Judged graduate presentations at the Chemistry and Biochemistry Graduate Research Conference, Concordia University, Canada
- 09/2003 – 10/2003 - Guest Lecturer in Supramolecular Self-assembly course, Concordia University, Canada
- 04/2003 – 05/2004 - Selected as a reviewer by National Research Council of Canada (NRC) to review research proposals
- 01/2003 – present - Post-doctoral Researcher, McGill University, Canada; Nanoparticles synthesis and assembly
- 07/2002 – 09/2002 - Submitted a research proposal for the Miller Research Fellowships at the University of California at Berkeley
- 08/2002 – 12/2002 - Post-doctoral Researcher, University of Toronto, Canada; Functional hybrid organic-inorganic materials
- 03/2002 – 04/2002 - Submitted a research proposal for the Natural Sciences and Engineering Research Council of Canada for Fellowships
- 09/1998 – 08/2002 - Teaching Assistant, University of Toronto, Canada; General Chemistry and Introductory Physical Chemistry
- Research Assistant, University of Toronto, Canada
- Organosilanes synthesis, nanoporous organic-inorganic hybrid materials, supramolecular self-assembly, catalysis, etc.

- Characterization skills: solution NMR, solid-state NMR, X-ray diffraction, gas adsorption, SEM, XPS, TEM, UV-Vis-NIR, Fluorescence, TGA, Photoconductivity, FT-Raman, FT-IR, etc.
- 08/1996 – 09/1998 - Research Assistant, State University of New York at Buffalo and Institute for Lasers, Photonics and Biophotonics, Buffalo, USA; Nano-fabrication, reverse micelles, sol-gel, nanocluster-polymer photorefractive, NLO, and photonics materials
- 09/1992 – 08/1996 - Assistant Lecturer and Graduate Teaching Assistant, Basic Sciences Department, Hawassa University, Awassa, Ethiopia
- 09/1991 – 06/1992 - Chemistry Tutor, Addis Ababa University, Ethiopia;  
- Undergraduate Research Assistant: Natural products

**Professional Societies and Service:**

- 2006 – 2009 Advisory Board Member, Journal *ChemTracts – Inorg. Chem.*
- 2007 – Present Advisory Board Member, International Symposiums on Nanoporous Materials.
- 2009 – Present Member, Catalysis Society of Metropolitan New York
- October 2010 Invited Annual Oversight Reviewer of the NIST/NSF Center for High Resolution Neutron Scattering (CHRNS) facility at NIST Campus, Gaithersburg, MD.
- September 2010 Invited Participant, NSF Ceramic Materials Principal Investigator Workshop, National Science Foundation, Washington, DC.
- August 2010 Invited Panelist, Fulbright Fellowship Selection Committee, Institute for International Education (IIE), New York City, NY.
- August 2010 Invited Panelist, SBIR Program, Nanotechnology, Environmental Protection Agency (EPA), Washington, DC.
- July 2010 Panelist, STAR Program, Environmental Protection Agency (EPA), Washington, DC.
- May 2010 Reviewer of Tenure Packet for National Central University of Taiwan, Taipei, Taiwan.
- April 2010 Invited Panelist, SBIR Program, National Science Foundation, Washington, DC.
- October 2009 Invited Panelist, SBIR Program, Nanotechnology, Environmental Protection Agency (EPA), Washington, DC.
- November 2008 Invited Panelist, Small Business Innovation Research (SBIR), Nanotechnology, Environmental Protection Agency (EPA), Washington, DC.
- March 2008 Panelist Member, Materials World Network, Division of Materials Research, National Science Foundation (NSF), Washington, DC.
- April 2008 Panelist, Joint NSF–DFG, Materials World Network (MWN), Bonn, Germany (One of the three participants from the US).
- November 2008 Panelist, CAREER Proposals, Solid State and Materials Chemistry, National Science Foundation, Washington, DC.
- August 2007 Panelist, Nanotechnology, Environmental Protection Agency (EPA), Washington, DC.

August 2006	Panelist, Small Business Innovation Research (SBIR), Nanotechnology, Environmental Protection Agency (EPA), Washington, DC.
1999–Present	Member, American Chemical Society (ACS).
2000–2002	Member, Materials Research Society (MRS).
2010–Present	Member, American Ceramics Society (ACerS).
2000–2002	Organizer, University of Toronto, Chemistry Soccer Team.
2003–2005	Member, McGill University, Chemistry Soccer Team.
2001–Present	Member, Association for Higher Education and Development (FANA, AHEAD, Ethiopian Canadian Scientists for helping higher education in Ethiopia).

**Awards and Fellowships:**

- NSF Special Creativity Award with \$170,000.00 from the National Science Foundation, 2011-2013
- NSF Grant, \$325,000.00 from the National Science Foundation Environmental Health and Safety of Nanotechnology (NanoEHS) Program in the Chemical, Environmental, Bioengineering, and Transport Systems (CBET) Division, 2011 – 2014
- NSF-DMR, American Competitiveness and Innovation (ACI) Fellow, One of the 10 Awardees for 2010.
- NSF CAREER Award, 2007 – 2012
- NSF Grant, Division of Materials Research (DMR), 2008 – 2011
- Two Awards, Collaborative Activities for Research and Technology Innovation (CARTI) Grants, Syracuse Center of Excellence in Environmental and Energy Systems (Syracuse CoE), 2007 – 2009
- One Grant, Empire State Development Corporation, 2007 – 2009
- Instrumentation Grant, National Science Foundation, 2007 – 2008
- Fulbright Scholar, 1996 – 1998, University of Delaware, USA and State University of New York at Buffalo, USA
- Dean's List, B.Sc., 1992, Addis Ababa University, Ethiopia
- Distinction Graduate and First Rank, 1992, Chemistry Department, Addis Ababa University, Ethiopia
- Teaching / Research Assistantships, 1996 – 1998, Chemistry Department, State University of New York at Buffalo, USA
- Teaching / Research Assistantships, 1998-2002, Chemistry Department, University of Toronto, Canada
- University of Toronto Open Fellowships, 1999 – 2002, Chemistry Department, University of Toronto, Toronto, Canada

## **Publications, Book Chapters, Patents and Conference Presentations:**

### **Book**

- (1) "Nanocatalysis: Synthesis and Applications" ≈ 450 pages, To be Edited by Vivek Polshettiwar and Tewodros Asefa, Wiley-Blackwell John Wiley & Sons, Inc., *In Preparation*.

### **Book Chapters**

- (1) Polshettiwar, V.\*; Asefa, T.\*; Narayanan, R.\* "Introduction to Nanocatalysis" 20 Pages, *Book Chapter* In "Nanocatalysis: Synthesis and Applications" (V. Polshettiwar, T. Asefa, eds.), Wiley-Blackwell John Wiley & Sons, Inc., *In Preparation*.
- (2) Asefa, T.\*; Biradar, A. V.; Das, S.; Sharma, K. K. "Nanocatalysts for the Heck Coupling Reactions" 40 pages, *Book Chapter* In "Nanocatalysis: Synthesis and Applications" (V. Polshettiwar, T. Asefa, eds.), Wiley-Blackwell John Wiley & Sons, Inc., *In Preparation*.
- (3) Asefa, T.\*; Biradar, A. V.; Das, S.; Sharma, K.; K. Nanostructured Catalysts for the Henry, Aldol, and Knoevenagel Reactions" 30 pages, *Book Chapter* In "Nanocatalysis: Synthesis and Applications" (V. Polshettiwar, T. Asefa, eds.), Wiley-Blackwell John Wiley & Sons, Inc., *In Preparation*.
- (4) Asefa, T.\*; Anan, A.; Duncan, C. T.; Xie, Y. "Spherical & Anisotropic Non-Magnetic Core-shell Nanomaterials - Synthesis and Characterization" *Invited Book Chapter* in a Book "Non Magnetic Bi-Metallic and Metal Oxide Nanomaterials for Life Sciences", Editor: Challa S. S. R. Kumar, Wiley-VCH, Volume 3, Chapter 9, **2009**, pp. 281-330.
- (5) Asefa, T.\*; Anan, A.; Duncan, C. T.; Xie, Y. "Functionalized Nanoporous and Mesoporous Heterogeneous Catalysts – New Synthetic Strategies and Applications" *Invited Book Chapter* in a Book "Heterogeneous Catalysis Research Progress", Editor: Mathias B. Gunther, Nova Publishers, New York, Chapter 2, **2009**, pp. 81-110.
- (6) Asefa, T.\*; Sharma, K. K.; Anan, A.; Vathyam, R.; Buckley, R. P.; Dam, H. M.; Xie, Y.; Quinlivan, S.; Wang, G.; Duncan, C. "Efficient and Selective Nanoporous Catalysts by Placing Multiple Site-Isolated Functional Groups on Mesoporous Materials" *Invited Book Chapter* In "Nanoporous Materials" (A. Sayari and M. Jaroniec, eds.), World Scientific Publ. Co., Singapore, **2008**, pp. 497-508.

## Peer-Reviewed Publications

### 2012

- (70) Silva, R.; Asefa, T.\* “Noble Metal-Free Oxidative Electrocatalysts: Polyaniline and Co(II)-Polyaniline Nanostructures Hosted in Nanoporous Silica” *Adv. Mater.*, **2012**, 24, 1878–1883.
- (69) Silva, R.; Al-Sharab, J.; Asefa, T.\* “Edge Plane-Rich Nitrogen-Doped Carbon Nanoneedles (CNNs) and Efficient Metal-Free Electrocatalysts”, *Angew Chem. Int. Ed.*, **2012**, Under Revision.
- (67) Das, S.; Asefa, T.\* “Core-Shell-Shell Microsphere Catalysts Containing Au Nanoparticles for Styrene Epoxidation” *Top. Catal.*, **2012**, *In Press (Accepted for Publication)*.
- (66) Biradar, A. V.; Asefa, T.\* “Nanosized Gold Catalyzed Oxidation of Alkyl-Substituted Benzenes” **2012**, Submitted.
- (65) Asefa, T.\* “Chiral Nematic Mesoporous Carbons from Self-Assembled Nanocrystalline Cellulose”, Invited Highlight Paper, *Angew Chem. Int. Ed.*, **2012**, 51, 2008–2010.
- (64) Wang, Y.; Biradar, A. V.; Asefa, T.\* “Hollow SiO<sub>2</sub>/Pd Nanoparticles/Porous SiO<sub>2</sub>/ZrO<sub>2</sub> Core/Multi-Shell Nanospheres with Tunable Structures and Efficient Catalytic Properties” *ChemSusChem*, **2012**, 5, 132–139.

### 2011

- (63) Silva, R.; Biradar, A. V.; Fabris, L.\*; Asefa, T.\* “Au/SBA-15 Based Robust and Convenient to Use Powdered Nanomaterial for Surface Enhanced Raman Scattering (SERS)” *J. Phys. Chem. C*, **2011**, 115, 22810 - 22817.
- (62) Biradar, A. V.; Biradar, A. A.; Asefa, T.\* “Silica-Dendrimer Core-Shell Nanospheres with Encapsulated Ultrasmall Palladium Nanoparticles as Efficient and Easily Recyclable Heterogeneous Nanocatalysts” *Langmuir*, **2011**, 27, 14408–14418
- (61) Ahmed, S.; Du Pasquier, A.; Birnie, D. P.\*; Asefa, T.\* “Self-Assembled TiO<sub>2</sub> with Increased Photoelectron Production, and Improved Conduction and Transfer: Enhancing Photovoltaic Performance of Dye-Sensitized Solar Cells” *ACS Appl. Mater. Interfaces*, **2011**, 3, 3002–3010.
- (60) Ahmed, S.; Du Pasquier, Asefa, T.\*; Birnie D. P. III.\* “Beneficial Microstructured TiO<sub>2</sub> Photoanodes for Dye Sensitized Solar Cells Highly Improved by Simple Surface Treatment” *Adv. Energy Mater.*, **2011**, 1, 879-887.

- (59) Vathyam, R.; Wondimu, E.; Zhang, C.; Hayes, S.; Tao, Z.; Asefa, T.\* "Improving Drug Adsorption and Release Properties on Nanostructured Materials with Temperature" *J. Phys. Chem. C*, **2011**, 115, 31135-31150.
- (58) Duncan, C. T.; Biradar, A. V.; Asefa, T.\* "Aminotroponimate/Aminotroponate-Zinc Complexes Functionalized Mesoporous Silica Catalysts for Intramolecular Hydroamination of Non-Activated Alkenes with Varied Steric and Electronic Properties" *ACS Catal.*, **2011**, 1, 736-750.
- (57) Sharma, K. K.; Biradar, A. V.; Asefa, T.\* "Bifunctional Organic-Inorganic Mesoporous Catalyst for Tandem Reactions" *Eur. J. Inorg. Chem.*, **2011**, 21, 3174-3182.
- (56) Al-Salam, S.; Al Samri, M. T.; Al Shamsi, M.; Tariq, S.; Benedict, S.; Sudhadevi, M.; Biradar, A. V.; Asefa, T.\*; Souid, A.-K.\* "In Vitro Study of Calcined Mesoporous Silica Nanoparticles in Mouse Lung" *Toxicol. Sci.*, **2011**, 122, 86-99.
- (55) Das, S.; Asefa, T.\* "Epoxide Ring Opening Reactions with Mesoporous Silica Supported Fe(III) Catalysts" *ACS Catal.*, **2011**, 1, 502-510.

## **2010**

- (54) Wang, Y.; Biradar, A. V.; Asefa, T.\* "Nanosphere Supported Shaped Pd Nanoparticles Encapsulated with Nanoporous Silica Shell: Efficient and Recyclable Nanocatalysts" *J. Mater. Chem.*, **2010**, 20, 7834-7841.
- (53) Al Shamsi, M.; Al Samri, M. T.; Al-Salam, S.; Conca, W.; Shaban, S.; Benedict, S.; Tariq, S.; Biradar, A.; Penefsky, H. S.; Asefa, T.\*; Souid, A.-K.\* "Biocompatibility of Calcined Mesoporous Silica Particles with Cellular Bioenergetics in Murine Tissues" *Chem. Res. Toxicol.*, **2010**, 23, 1796-1805.
- (52) Dikarev, E. V.; Kumar, D. K.; Filatov, A. S.; Anan, A.; Xie, Y.; Asefa, T.; Petrukhina, M. A.\* "Recyclable Dirhodium Catalysts Embedded into Nanoporous Surface-Functionalized Organosilica Hosts for Cyclopropanation Reactions" *ChemCatChem*, **2010**, 2, 1461-1466.
- (51) Biradar, A. V.; Sharma, K. K.; Asefa, T.\* "Continuous and Selective Henry Reaction over Nanoporous Silica-Supported Amine Catalyst on Fixed-Bed Reactor" *Appl. Catal. A: Chem.*, **2010**, 389, 19-26.
- (50) Duncan, C. T.; Biradar, A. V.; Rangan, S.; Mishler, R. E.; Asefa, T.\* "Widening, Exfoliation and Functionalization of Metal Oxide Nanostructures with Fluorinating Agent: A Route to Tuning Surfaces of Nanostructures" *Chem Mater.*, **2010**, 17, 4950-4963.

- (49) Wang, Y.; Asefa, T.\* “Controlled Synthesis of Water-Dispersible Cuboctahedral Copper Nanoparticles and their Catalytic Properties” *Chem. Eur. J.*, **2010**, *16*, 10735-10743.
- (48) Biradar, A. A.; Biradar, A. V.; Asefa, T.\* “Immobilization of Flavin-Containing Monooxygenase on Corrugated Silica Nanospheres and their Biocatalytic Activities” *ChemCatChem*, **2010**, *8*, 1004-1010.
- (47) Tao, Z.; Xie, Y.; Goodisman, J.;;\* Asefa, T.\* “Isomer-Dependent Adsorption and Release of Cis- and Trans-platin Anticancer Drugs by Mesoporous Silica Nanoparticles” *Langmuir*, **2010**, *26*, 8914-8924.
- (46) Tao, Z.; Toms, B. B.; Goodisman, J.;;\* Asefa, T.\* “Mesoporous Silica Nanoparticles Enhance the Cytotoxicity of Platinum Anticancer Drugs” *ACS Nano*, **2010**, *4*, 789-794.
- (45) Wang, Y.; Biradar, A. V.; Wang, G.; Shrama, K. K.; Asefa, T.\* “Poly(allylamine)-Stabilized Colloidal Copper Nanoparticles: Synthesis, Morphology, and Their Surface-Enhanced Raman Scattering Properties” *Langmuir*, **2010**, *26*, 7469-7474.
- (44) Sharma, K. K.; Biradar, A.; Asefa, T.\* “Substituent- and Catalyst-Dependent Selectivity to Aldol and Nitrostyrene Product in Heterogeneous Base Nanocatalysis” *ChemCatChem*, **2010**, *2*, 61-66.

## 2009

- (43) Tao, Z.; Xie, Y.; Toms, B. B.; Goodisman, J.; Asefa, T.\* “Mesoporosity and Functional Group Dependent Cytotoxicity of Silica Nanomaterials” *Chem. Res. Toxicol.* **2009**, *22*, 1869-1880.
- (42) Mishler, R. E.; Biradar, A. A.; Duncan, C. T.; Schiff, E. A.\*, Asefa, T.\*, “Solvent-Washable Polymer Templated Synthesis of Mesoporous Silica and Solid Acid Nanocatalysts in One-Pot” *Chem. Commun.*, **2009**, 6201-6203.
- (41) Asefa, T.\*, Duncan, C. T.; Sharma, K. K. *Invited Critical Review Paper* “Recent Advances in Nanostructured Sensors and Biosensors” *Analyst*, **2009**, *134*, 1980-1990. **(The Top Most Accessed Article between September – December 2009).**
- (40) Duncan, C. T.; Fleitsch, S.; Asefa, T.\* “Efficient Nanoporous Silica-Supported Zn-Tropone Heterogeneous Catalyst for Intramolecular Hydroamination Reaction” *ChemCatChem*, **2009**, *1*, 365-368.
- (39) Tao, Z.; Wang, G.; Goodisman, J, Asefa, T.\* “Accelerated Oxidation of Epinephrine by Silica Nanomaterials” *Langmuir*, **2009**, *25*, 10183-10188.



- (38) Asefa, T. \*, *Invited Commentary Paper on “Entrapping Cinchona Alkaloids within Metals: Chirally Imprinted Palladium by Rothenberg et al. Nature Chemistry, 2009”*, *Chemtracts Org. Chem.*, **2009**, 22, 121-128.
- (37) DiPasqua, A. J.; Shi, Y.-L.; Mishler, R. E.; Dabrowiak, J. D.\*; Asefa, T.\* “Preparation of Antibody-Conjugated Gold Nanoparticles” *Mater. Lett.*, **2009**, 63, 1876-1879.
- (36) Wang, G.; Otuonye, A.; Blair, E. A.; Denton, K.; Tao, Z.; Asefa, T.\* “Functionalized Mesoporous Materials with Improved Adsorption Capacity and Release Properties for Different Drug Molecules: A Comparative Study” *J. Solid State Chem.*, **2009**, 182, 1649-1660.
- (35) Xie, Y.; Sharma, K. K.; Anan, A.; Wang, G.; Biradar, A. V.; Asefa, T.\* “Efficient Nanostructured Catalysts for Aldol Condensation Reaction” *J. Catal.*, **2009**, 265, 131-140.
- (34) Asefa, T.\*; Wang, G.; Blair, E. A.; Otuonye, A., Denton, K. “Multifunctional Nanoporous Materials for Adsorption and Controlled Drug Release” *Adsorption*, **2009**, 15, 287-299.

## **2008**

- (33) Sharma, K. K.; Buckley, R. P.; Asefa, T.\* “Optimizing Cooperative Acid-Base Bifunctional Mesoporous Catalysts for the Henry Reaction: Effects of Separation Distance of Site-Isolated Groups on Cooperative Catalysis”, *Langmuir*, **2008**, 24, 14306-14320.
- (32) Asefa, T. “Book Review of Bio-inorganic Hybrid Nanomaterials: Strategies, Synthesis, Characterization and Applications” *J. Am. Chem. Soc.*, **2008**, 130, 8871-8871.
- (31) Asefa, T.\*, Shi, Y.-L. “Corrugated Nanospheres and Nanocages: Synthesis via Controlled Etching and Improving Chemical Delivery and Electrochemical and Biosensing Applications” *J. Mater. Chem.*, **2008**, 18, 5604-5614.
- (30) Anan, A.; Vathyam, R.; Asefa, T. \* “Controlling the Henry Reaction Products: Nitroalcohol versus Nitrostyrene by Simple Change of Amino-Groups of Aminofunctionalized Mesoporous Catalysts” *Catal. Lett.* **2008**, 126, 142-148.
- (29) Xie, Y.; Quinlivan, S.; Asefa, T.\* “Tuning Metal Nanostructures within SBA-15 by Changing Metal Complexes Reduced In-situ with Grafted Imines and Hemiaminals” *J. Phys. Chem. C.*, **2008**, 112, 9996-10003.

- (28) Tao, Z.; Morrow, M. P.; Sharma, K. K.; Duncan, C.; Anan, A.; Asefa, T.; Penefsky, H. S.; Goodisman, J.\*; Kader, A.\* "Mesoporous Silica Nanoparticles Inhibit Cellular Respiration" *Nano Lett.*, **2008**, 8, 1517-1526. (*Cited 23 times to date*)
- (27) Anan, A.; Sharma, K. K.; Asefa, T.\* "Selective Efficient Trifunctional Nanoporous Catalysts for Nitroaldol Condensation: Co-Placement of Site-Isolated Multiple Functional Groups on Mesoporous Materials" *J. Mol. Catal. A: Chem.*, **2008**, 288, 1-13. (*Chosen as an Editor's Choice Article*)
- (26) Sharma, K. K.; Anan, A.; Buckley, R. P.; Ouellette, W.; Asefa, T.\* "Towards Efficient Nanoporous Catalysts: Controlling Site-Isolation and Concentration of Grafted Catalytic Sites on Nanoporous Materials with Solvents and Colorimetric Elucidation of their Site-Isolation" *J. Am. Chem. Soc.* **2008**, 130, 218-228.
- (25) Di Pasqua, A. J.; Sharma, K. K.; Shi, Y.-L.; Toms, B. B.; Ouellette, W.; Dabrowiak, J. C.\*; Asefa, T.\* "Cytotoxicity of mesoporous silica nanomaterials" *J. Inorg. Biochem.*, **2008**, 102, 1416-1423. (*Cited 41 times to date*)

### **2007**

- (24) Sharma, K. K.; Asefa, T.\* "Efficient bifunctional nanocatalysts by simple postgrafting of spatially-isolated catalytic groups on mesoporous materials" *Angew. Chem., Int. Ed.*, **2007**, 46, 2879-2882. (*Cited 68 times to date*).
- (23) Shi, Y.-L.; Asefa, T.\* "Tailored core-shell-shell nanostructures: Sandwiching gold nanoparticles between silica cores and tunable silica shells" *Langmuir*, **2007**, 23, 9455-9462. (*Among the Top Ten Most Accessed Articles in 2007 and Cited 24 times to date*).

### **2006**

- (22) Asefa, T.\*; Shi, T.-L. "Super-stable high-quality Fe<sub>3</sub>O<sub>4</sub> dendron-nanocrystals dispersible in both organic and aqueous solutions" *Chemtracts Inorg. Chem.*, **2006**, 19, 299-305.

### **Publications Prior to 2006 (as a Postdoctoral and as a Graduate Student)**

- (21) Asefa, T.; Lennox, R. B. "Synthesis of gold nanoparticles via electroless deposition in SBA-15." *Chem. Mater.*, **2005**, 17, 2481-2483
- (20) Whitnall, W.; Asefa, T.; Ozin, G. A. "Hybrid periodic mesoporous organosilicas" *Adv. Funct. Mater.* **2005**, 15, 1696-1702.
- (19) Asefa, T.; Kruk, M.; Coombs, N.; Grondey, H.; MacLachlan, M. J.; Jaroniec, M.; Ozin, G. A. "Novel Routes to Periodic Mesoporous Aminosilicas, PMAs:

Ammonolysis of Periodic Mesoporous Organosilicas” *J. Am. Chem. Soc.* **2003**, *125*, 1662-11673.

- (18) Kruk, M.; Asefa, T.; Coombs, N.; Jaroniec, M.; Ozin, G. A. “Synthesis and characterization of ordered mesoporous silicas with high loadings of methyl groups” *J. Mater. Chem.* **2002**, *12*, 3452-3457.
- (17) Kuroki, M.; Asefa, T.; Whitnal, W.; Kruk, M.; Yoshina-Ishii, C.; Jaroniec, M.; Ozin, G.A. “Synthesis and Properties of 1,3,5-Benzene Periodic Mesoporous Organosilica (PMO): Novel Aromatic PMO with Three Point Attachments and Unique Thermal Transformations.” *J. Am. Chem. Soc.* **2002**, *124*, 13886-13895.
- (16) Kruk, M.; Asefa, T.; Jaroniec, M.; Ozin, G. A. “Synthesis and characterization of methyl and vinyl-functionalized ordered mesoporous silicas with high organic content.” *Stud. Surf. Sci. Catal.* **2002**, *141*, 197-204.
- (15) Asefa, T.; Ozin, G. A.; Grondey, H.; Kruk, M.; Jaroniec, M. “Recent developments in the synthesis and chemistry of periodic mesoporous organosilicas.” *Stud. Surf. Sci. Catal.* **2002**, *141*, 1-26.
- (14) Asefa, T.; Coombs, N.; Grondey, H.; Jaroniec, M.; Kruk, M.; MacLachlan, M. J.; Ozin, G. A. “Bio-inspired nanocomposites: from synthesis toward potential applications.” *Mater. Res. Soc. Symp. Proc.* **2002**, *711*, 347-357.
- (13) Kruk, M.; Asefa, T.; Jaroniec, M.; Ozin, G.A. “Metamorphosis of Ordered Mesopores to Micropores: Periodic Silica with Unprecedented Loading of Pendant Reactive Organic Groups Transforms to Periodic Microporous Silica with Tailorable Pore Size.” *J. Am. Chem. Soc.* **2002**, *124*, 6383-6392. •
- (12) Matos, J. R.; Kruk, M.; Mercuri, L. P.; Jaroniec, M.; Asefa, T.; Coombs, N.; Ozin, G. A.; Kamiyama, T.; Terasaki, O. “Periodic Mesoporous Organosilica with Large Cage-like Pores.” *Chem. Mater.* **2002**, *14*, 1903-1905. •
- (11) Temtsin, G.; Asefa, T.; Bittner, S.; Ozin, G.A. “Aromatic PMOs: tolyl, xylyl and dimethoxyphenyl groups integrated within the channel walls of hexagonal mesoporous silicas.” *J. Mater. Chem.* **2001**, *11*, 3202-3206.
- (10) Asefa, T.; Kruk, M.; MacLachlan, M.J.; Coombs, N.; Grondey, H.; Jaroniec, M.; Ozin, G. A. “Sequential hydroboration-alcoholysis and epoxidation-ring opening reactions of vinyl groups in mesoporous vinylsilica.” *Adv. Funct. Mater.* **2001**, *11*, 447-456.
- (9) Asefa, T.; Kruk, M.; MacLachlan, M. J.; Coombs, N.; Grondey, H.; Jaroniec, M.; Ozin, G. A. “Novel Bifunctional Periodic Mesoporous Organosilicas, BPMOs: Synthesis, Characterization, Properties and in-Situ Selective Hydroboration-Alcoholysis Reactions of Functional Groups.” *J. Am. Chem. Soc.* **2001**, *123*, 8520-8530. (Cited 191 times to date). •

- (8) Dag, O.; Yoshina-Ishii, C.; Asefa, T.; MacLachlan, M. J.; Grondey, H.; Coombs, N.; Ozin, G. A. "Oriented periodic mesoporous organosilica (PMO) film with organic functionality inside the channel walls." *Adv. Funct. Mater.* **2001**, *11*, 213-217. **(Cited 108 times to date).**
- (7) Asefa, T.; Coombs, N.; Dag, O.; Grondey, H.; MacLachlan, M.J.; Ozin, G.A.; Yoshina-Ishii, C. "Periodic mesoporous organosilicas (PMOs): nanostructured organic-inorganic hybrid materials." *Mater. Res. Soc. Symp. Proc.* **2001**, *628*, CC3.9.1-CC3.9.8.
- (6) Asefa, T.; Yoshina-Ishii, C.; MacLachlan, M. J.; Ozin, G. A. "New nanocomposites: putting organic function 'inside' the channel walls of periodic mesoporous silica." *J. Mater. Chem.* **2000**, *10*, 1751-1755. **(Among the 10 most accessed articles in 2000; On the Front Cover; and Cited 142 times to date).** \*
- (5) MacLachlan, M. J.; Asefa, T.; Ozin, G. A. "Writing on the wall with a new synthetic quill." *Chem. Eur. J.* **2000**, *6*, 2507-2511. **(On Front Cover and Cited 109 times)**  
●●
- (4) Asefa, T.; MacLachlan, M. J.; Grondey, H.; Coombs, N.; Ozin, G. A. "Metamorphic channels in periodic mesoporous methylenesilica." *Angew. Chem., Int. Ed.* **2000**, *39*, 1808-1811. **(Cited over 192 times to date)** ●●
- (3) Asefa, T.; MacLachlan, M. J.; Coombs, N.; Ozin, G. A. "Periodic mesoporous organosilicas with organic groups inside the channel walls." *Nature* **1999**, *402*, 867-871. **(Cited 965 times to date)** ●●●
- (2) Yoshina-Ishii, C.; Asefa, T.; Coombs, N.; MacLachlan, M. J.; Ozin, G. A. "Periodic mesoporous organosilicas, PMOs: fusion of organic and inorganic chemistry 'inside' the channel walls of hexagonal mesoporous silica." *Chem. Commun.* **1999**, 2539-2540. **(Cited 278 times to date)** ●●●
- (1) Lal, M.; Joshi, M.; Kumar, D.N.; Friend, C.S.; Winiarz, J.; Asefa, T.; Kim, K.; Prasad, Paras N. "Inorganic-organic hybrid materials for photonics." *Mater. Res. Soc. Symp. Proc.* **1998**, *519*, 217-225.

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- Citations over >900 times in 9 years and Featured in C&E News
- Cited over >270 times
- On Front Covers of Journals and Cited over >140 times
- Cited over 80 times
- \* Among the top most accessed articles in RSC journals in 2000

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## Patents:

(1) Inventors: Asefa, T. \*, Fuller, R.; Schiff, E. A.

“Mesoporous and Nanoporous Materials, and Methods of Synthesizing the Same”

*US Patent Application Number: 20100313937; Application Date: 12-16-2011*

A method for synthesizing a phosphonic acid functionalized mesoporous metal oxide material (e.g., silica, titania, alumina, preferably silica material) is provided. Further, a method of using the phosphonic acid functionalized mesoporous silica material as a solid acid catalyst in a pinicole-pinacolone rearrangement reaction, and a method of using a phosphonic acid functionalized mesoporous silica material as a solid acid catalyst in a transesterification reaction is provided. A method for preparing a mesoporous titania film for use in a dye sensitized solar cell is also provided.

(2) Inventors: Asefa, T. \*, Shi, Y.-L “

“Corrugated and Nanoporous Microstructures and Nanostructures, and Methods for Synthesizing the Same”

*US Patent Application Number: 20100093013; Application Date: 04-15-2010*

- A method of synthesizing corrugated and nanoporous microspheres including the steps of synthesizing substantially smooth spherical microspheres, and controlled wet-etching of the substantially smooth spherical microspheres with a basic solution having a pH above 10.00 is provided. The microspheres can include, for example, silica microspheres or titania microspheres of various sized diameters of between 50 nm and 600 nm. The basic solution can include an aqueous potassium cyanide solution or an aqueous potassium hydroxide solution. Methods of using the corrugated and nanoporous microspheres described herein are also provided.

(3) Inventors: Asefa, T. \*, Sharma, K. K., Anan, A.

“Selective and Efficient Bifunctional and Trifunctional Nanoporous Catalysts”

*US Patent Application Number: 20090043134; Application Date: 02-12-2009*

Selective and efficient multifunctional nanoporous catalysts containing spatially distributed organoamine and silanol groups, and methods of preparation thereof. The catalysts have been observed to be very highly efficient in catalysis of the Henry reaction.

(4) Inventors: W. Whitnal, T. Asefa, G. A. Ozin

“Hybrid Organic-Inorganic Mesoporous Materials”, Licenced to The Governing Council of the University of Toronto, Canada.

US Patent Application Number: US 2008/0193734 A1; Patent Filed: 03/16/2005.

(5) Inventors: T. Asefa and G. A. Ozin

“Functionalized organometallic crystalline Mesoporous material prepared by metalation-condensation of organometallic compounds”

Licensed to ExxonMobil Research and Engineering Company, USA.

US Patent **US 6,960,551**.

**Conference Presentations and Non-Refereed Conference Papers:**

- (1) T. Asefa, N. Coombs, Ö. Dag, C. Yoshina-Ishii, M. J. MacLachlan, G. A. Ozin, “Periodic mesoporous organosilicas (PMOs) with functional organic groups inside the channel walls”, *Abstr. Pap. - Am. Chem. Soc.*, 219<sup>th</sup> American Chemical Society National Meeting, Inorganic Division, INOR-737, Spring **2000**, San Francisco, CA.
- (2) T. Asefa, N. Coombs, Ö. Dag, H. Grondy, M. J. MacLachlan, G. A. Ozin, C. Yoshina-Ishii, “Periodic mesoporous organosilicas (PMOs): nanostructured organic-inorganic hybrid materials”, *Invited oral presentation*, Materials Research Society (MRS) Symposium, Organic-Inorganic Hybrid Materials, Spring **2000**, San Francisco, CA, USA.
- (3) T. Asefa, N. Coombs, Ö. Dag, C. Yoshina-Ishii, M. J. MacLachlan, G. A. Ozin, “Periodic mesoporous organosilicas (PMOs): New nanocomposites”, *Poster presentation*, Davenport Chemical Laboratory opening ceremony, Fall **2000**, Department of Chemistry, University of Toronto, Toronto, Canada.
- (4) T. Asefa, “Polysilane based photorefractive materials: synthesis, properties and applications”, *Research proposal*, March **2000**, Department of Chemistry, University of Toronto, Toronto, ON, Canada.
- (5) T. Asefa, M. J. MacLachlan, N. Coombs, H. Grondy, G. A. Ozin, “Reactivity of functional groups in periodic mesoporous organosilicas”, *Abstr. Pap. - Am. Chem. Soc.* 221<sup>st</sup> American Chemical Society National Meeting, INOR-471, **2001**, San Diego, CA.
- (6) T. Asefa, M. J. MacLachlan, N. Coombs, H. Grondy, G. A. Ozin, “Reactivity and transformation of organic functional groups of periodic mesoporous organosilica materials”, *Abstr. Pap. - Am. Chem. Soc.* 221<sup>st</sup> American Chemical Society National Meeting, INOR-594, **2001**, San Diego, CA.
- (7) T. Asefa, N. Coombs, H. Grondy, M. Jaroniec, M. Kruk, M. J. MacLachlan, G. A. Ozin “Bio-inspired nanocomposites: from synthesis towards potential applications”, *Invited oral presentation*, Materials Research Society (MRS) Symposium, Fall **2001**, Boston, MA, USA.
- (8) T. Asefa, N. Coombs, H. Grondy, M. Jaroniec, M. Kruk, M. J. MacLachlan, G. A. Ozin, “New hybrid multifunctional mesoporous materials: substitution of oxide and organic moieties of periodic mesoporous organosilica materials by heteroatom

- functional groups”, *Invited oral presentation*, Materials Research Society Symposium, Spring **2002**, San Francisco, CA, USA.
- (9) T. Asefa, N. Coombs, M. Jaroniec, M. Kruk, G. A. Ozin, “Multifunctional hybrid organic-inorganic mesoporous and microporous materials”, *Oral presentation*, American Chemical Society National Meeting, Spring **2002**, Orlando, FL, USA.
- (10) T. Asefa, N. Coombs, M. Jaroniec, M. Kruk, G. A. Ozin, “Multifunctional hybrid organic-inorganic mesoporous and microporous materials”, *Poster presentation*, American Chemical Society National Meeting, Spring **2002**, Orlando, FL, USA.
- (11) T. Asefa, G. A. Ozin, H. Grondy, M. Kruk, M. Jaroniec, “Novel nanocomposites: periodic mesoporous organosilicas”, *Plenary lecture*, Nanoporous – III, June, **2002**, Ottawa, ON, Canada.
- (12) T. Asefa, “Hybrid nanoporous materials”, *Invited talk*, Institute for Microstructural Sciences, National Research Council (NRC), January **2003**, Ottawa, ON, Canada.
- (13) T. Asefa, R. Bruce Lennox, “Large Scale Electroless Synthesis of Gold Nanomaterials and Au/SBA-15 nanocomposites”, *Oral presentation*, American Chemical Society National Meeting, Summer **2005**, Washington, D.C., USA.
- (14) T. Asefa, D. Gadre “Multifunctional nanostructures: Nanostructured materials and surfaces via templating and self-assembly of bifunctional molecules”, *Oral Presentation*, American Chemical Society National Meeting, Spring **2006**, Atlanta, GA, USA
- (15) T. Asefa, D. Gadre “Functional nanoscale and nanoporous materials: Synthesis, self-assembly and potential applications”, *Poster presentation*, American Chemical Society National Meeting, Spring **2006**, Atlanta, GA, USA.
- (16) T. Asefa, "Novel Organosilosequioxanes: The design and synthesis of organosilanes as precursors to highly functional nanostructured materials", Invited Talk, American Chemical Society, Northeast Regional Meeting, October **2006** (NERM 2006), Binghamton, NY, USA.
- (17) T. Asefa, “Multifunctional Nanomaterials: Synthesis via electrodeposition, self-assembly and templating” *Oral presentation*, American Chemical Society, Northeast Regional Meeting, October **2006** (NERM 2006), Binghamton, NY, USA.
- (18) T. Asefa, K. K. Sharma “Efficient acid-base bifunctional mesoporous catalysts for Henry reaction or nitroaldol condensation” *Oral presentation*, American Chemical Society National Meeting, Spring **2007**, Chicago, IL, USA.
- (19) T. Asefa, E. Blair, J. C. Dabrowiak, A. J. Di Pasqua “Multifunctional mesoporous nanomaterials for drug delivery” *Oral presentation*, American Chemical Society National Meeting, Spring **2007**, Chicago, IL, USA.
- (20) T. Asefa, K. K. Sharma “Bifunctional mesoporous nanocatalysts by solvent-assisted postgrafting synthesis” *Poster presentation*, American Chemical Society National Meeting, Spring **2007**, Chicago, IL, USA.
- (21) T. Asefa, E. Blair, J. C. Dabrowiak, A. J. Di Pasqua “Adsorption and controlled release of chemicals and drug molecules by functionalized mesoporous nanospheres” *Poster presentation*, American Chemical Society National Meeting, Spring **2007**, Chicago, IL, USA.
- (22) Y.-L. Shi, T. Asefa “Shaped core-shell nanostructures: Shaped synthesis of gold nanoshells with tunable optical properties on silica nanospheres” *Oral presentation*,

- American Chemical Society National Meeting, Spring **2007**, Chicago, IL, USA.
- (23) Y.-L. Shi, T. Asefa “Core-shell-shell nanostructures with nanoparticles sandwiched in between metal oxides: SiO<sub>2</sub>/Au nanoparticles/nanoporous silica core-shell nanomaterials” *Poster presentation*, American Chemical Society National Meeting, Spring **2007**, Chicago, IL, USA.
- (24) T. Asefa “Multifunctional cooperative and selective nanocatalysts” *Poster Presentation*, Gordon Research Conference, Solid State Chemistry, Magdalene College, Oxford University, September **2007**, Oxford, England.
- (25) T. Asefa, A. Anan, R. Vathyam, Y. Xie, C. Duncan, S. Quinlivan, G. Wang, Y.-L. Shi, “Multifunctional nanostructured materials and selective efficient catalysts: New synthetic strategies and their potential applications from catalysis to drug delivery” INOR-1061, *Oral presentation*, American Chemical Society National Meeting, Spring **2008**, New Orleans, LA, USA.
- (26) T. Asefa, K. K. Sharma, R. P. Buckley, H. M. Dam, “New synthetic methods to efficient nanoporous catalysts by solvent-assisted grafting and probing of their site-isolation on mesoporous materials” INOR-336, *Oral presentation*, American Chemical Society National Meeting, Spring **2008**, New Orleans, LA, USA.
- (27) T. Asefa, A. J. Di Pasqua, Y.-L. Shi, J. C. Dabrowiak, “Antibody-conjugated gold nanoparticles for detection of pathogens in water” COLL-146, *Oral presentation*, American Chemical Society National Meeting, Spring **2008**, New Orleans, LA, USA.
- (28) T. Asefa “New rational design and synthetic approaches to multifunctional nanomaterials” *Invited Oral Presentation*, International Symposium of Nanoporous Materials V, Spring **2008**, Vancouver, BC, Canada.
- (29) T. Asefa, A. Anan, R. Vathyam, Y. Xie, C. Duncan, S. Quinlivan, G. Wang, Y.-L. Shi, “Multifunctional nanostructured materials and selective efficient catalysts: New synthetic strategies and their potential applications from catalysis to drug delivery” INOR-1061, *Oral presentation*, 235th ACS National Meeting, New Orleans, Spring, **2008**.
- (30) T. Asefa, K. K. Sharma, R. P. Buckley, H. M. Dam, “New synthetic methods to efficient nanoporous catalysts by solvent-assisted grafting and probing of their site-isolation on mesoporous materials” Abstr. Pap. - 235th ACS National Meeting, New Orleans, April 6-10, **2008**, INOR-336.
- (31) T. Asefa, A. J. Di Pasqua, Y.-L. Shi, J. C. Dabrowiak, “Antibody-conjugated gold nanoparticles for detection of pathogens in water” Abstr. Pap. - 235th ACS National Meeting, New Orleans, April 6-10, **2008**, COLL-146.
- (32) T. Asefa “Corrugated and Nanoporous Silica Microspheres and Core-Shell Nanostructures for Drug Delivery and Biosensing Applications” Abstr. Pap. - 237th ACS National Meeting, Salt Lake City, UT, Spring, **2009**.
- (33) T. Asefa “Efficient and Selective Nanoporous Heterogeneous Catalysts for Various Reactions” Abstr. Pap. - 237th ACS National Meeting, Salt Lake City, UT, Spring **2009**.
- (34) T. Asefa “Multifunctional Hybrid Nanomaterials: From Synthesis to Potential



Applications in Catalysis and medicine” Oral Presentation, International Conference on Multifunctional, Hybrid and Nanomaterials, Hybrid Materials 2009, Spring **2009**, Tours, France.

- (35) T. Asefa, A. Biradar “New Bifunctional Mesoporous and Nanostructured Catalysts for Tandem Reactions” Abstr. Pap. - 239th ACS National Meeting, San Francisco, Spring **2010**.
- (36) T. Asefa, Y. Wang “Multicore Sub-10-nm Pd Nanoparticles Encapsulated with Nanoporous Silica Shell: Synthesis and their Efficient Catalytic Properties” Abstr. Pap. - 239th ACS National Meeting, San Francisco, Spring **2010**.
- (37) T. Asefa, Nanostructured Ceramics and Robust Nanocatalysts by Nitridization of Nanoporous and Nanostructured Metal Oxides”, Invited Poster Presentation, NSF Ceramic Materials Principal Investigator Workshop, National Science Foundation, September **2010**, Washington, DC.
- (38) T. Asefa “Multifunctional Nanomaterials: From Novel Synthetic Methods to their Applications in Catalysis and Drug Delivery” Oral Presentation, Pacificchem, December **2010**, Honolulu, Hawaii.
- (39) T. Asefa “Corrugated Nanospheres: From Synthesis to their Potential Applications in Catalysis and Biology” Oral Presentation, 85<sup>th</sup> ACS Colloid and Surface Science Symposium, Montreal, Quebec, Canada, July 2011.
- (40) T. Asefa “Porous Silica Nanomaterials for Efficient Drug Delivery and Improving Cytotoxicity of Anticancer drugs”, 9<sup>th</sup> International Nanomedicine and Drug Delivery Symposium, NanoDDS’11, Salt Lake City, UT, October, 2011.

### **Invited Talks:**

#### **2011**

- (87) Invited Talk, ChemShow 2011 and Nanotechnology Conference, Basic Chemistry of Green/Bio-Nano Convergence, New York City, November 1, 2011.
- (86) Invited Speaker, 9<sup>th</sup> International Nanomedicine and Drug Delivery Symposium, NanoDDS’11, Salt Lake City, UT, October, 2011.
- (85) Invited Oral Presentation, Joint Rutgers-BASF Catalysis Meeting, Nutley, NJ, May 2011.
- (84) Oral Presentation, 85<sup>th</sup> ACS Colloid and Surface Science Symposium, Montreal, Quebec, Canada, July 2011.
- (83) Keynote Lecture, Omega Chi Epsilon (the American Honor Society for Chemical Engineering Students) induction, Rutgers University, Piscataway, NJ, Spring 2011.
- (82) Invited Lecture, Nanomaterials Class, Materials science and Engineering Department, Rutgers University, Piscataway, NJ, Spring 2011.
- (81) Invited Lecture, Nanomedicine Class, Biomedical Engineering Department, Rutgers University, Piscataway, NJ, Spring 2011.

#### **2010**

- 80) Invited Talk, Pacificchem, Honolulu, Hawaii, December 2010.
- 79) Invited Poster Presentation, NSF Ceramic Materials Principal Investigator Workshop, National Science Foundation, Washington, DC, September 2010.
- 78) Oral Presentation, New Graduate students, Chemical and Biochemical Engineering Department, Rutgers, Piscataway, NJ, September 2010.
- 77) Oral Presentation, Rutgers Governors' School, Piscataway, NJ, Summer 2010.
- 76) Invited Talk, Joint Princeton-Rutgers Research Conference, Princeton University, Princeton, NJ, Spring 2010.
- 76) Invited Talk, Joint Rutgers-Roche Research Meeting, Roche, Nutley, NJ, March, 2010.
- 75) Poster Presentation, 239th ACS National Meeting, San Francisco, Spring 2010.
- 74) Oral Presentation, 239th ACS National Meeting, San Francisco, Spring 2010.
- 73) Invited Lecture, Nanomaterials Class, Materials science and Engineering Department, Rutgers University, Piscataway, NJ, Spring 2010.
- 72) Invited Talk, IGERT Students, Rutgers University, Piscataway, NJ, Spring 2010.
- 71) Invited Talk, City College, City University of New York, April 2010.
- 70) Invited Talk, New Jersey Institute of Technology (NJIT), March 2010.

## **2009**

- 69) Invited Talk, Rutgers University at Newark, Newark, NJ, October 2009.
- 68) Invited Talk, Fairleigh Dickinson University, Madison, NJ, September 2009.
- 67) Invited Talk, International Conference on Multifunctional, Hybrid and Nanomaterials, Hybrid Materials 2009, March 2009, Tours, France.
- 64) Invited Talk, Rutgers University, New Brunswick, NJ, February 2009.
- 63) Invited Visit, vant Hoff's Institute of Molecular Sciences, University of Amsterdam, Amsterdam, the Netherlands, February 2009.
- 62) 237<sup>th</sup> American Chemical Society National Meeting "Efficient and selective nanoporous heterogeneous catalysts for various (tandem) reactions" *Oral Presentation*, Inorganic Division, March 2009, Salt Lake City, UT, USA
- 61) 237<sup>th</sup> American Chemical Society National Meeting "Corrugated and nanoporous nanopheres for drug delivery and biosensing applications" *Oral Presentation*, Division of Colloid & Surface Chemistry, Applications in Nanoscience, March 2009, Salt Lake City, UT, USA.
- 60) 237<sup>th</sup> American Chemical Society National Meeting "Functionalized nanospheres for targeted drug delivery applications and their biocompatibility (cytotoxicity)" *Oral Presentation*, Division of Inorganic Chemistry, Materials Applications, March 2009, Salt Lake City, UT, USA.

## **2008**

- 59) Invited Talk "Food Nanotechnology", Cornell University, September 2008.
- 58) Invited Talk, GoNano Symposium, University of Toronto, Toronto, Canada, October 2008.
- 57) 235<sup>th</sup> American Chemical Society National Meeting "Multifunctional nanostructured materials and selective efficient catalysts: New synthetic strategies and their potential

applications from catalysis to drug delivery” *Oral Presentation*, March 2008, New Orleans, LA, USA.

- 56) 235<sup>th</sup> American Chemical Society National Meeting, “New synthetic methods to efficient nanoporous catalysts by solvent-assisted grafting and probing of their site-isolation on mesoporous materials” *Oral Presentation*, March 2008, New Orleans, LA, USA.
- 55) 235<sup>th</sup> American Chemical Society National Meeting, “Antibody-conjugated gold nanoparticles for detection of pathogens in water” COLL-146, *Oral Presentation*, New Orleans, LA, April 2008.
- 54) Invited Talk at International Symposium of Nanoporous Materials – V, Vancouver, British Columbia, May 2008.
- 53) Invited Talk at 82<sup>nd</sup> ACS Colloid and Surface Science Symposium, North Carolina State University, Raleigh, NC, June 2008.

## **2007**

- 52) Department of Chemistry, Utica College, Utica, NY, Nov. 2007
- 51) Participant and Invited talk at O'Brien & Gere / Syracuse University /SUNY ESF Technology Day Conference, Spring 2007.
- 50) Department of Chemistry, Kenyon College, Gambier, OH, 2007.
- 49) Two Oral presentations at the American Chemical Society National Meeting, Chicago, IL, Spring 2007.
- 48) Two Poster presentations at the American Chemical Society National Meeting, Chicago, IL, Spring 2007.
- 47) Invited Speaker at Café Scientifique, "Nanoscience and Nanotechnology: About Little Things but Big Science and Technology" Milton Rubenstein Museum of Science and Technology, Syracuse, NY, Feb. 2007.
- 46) Invited Panelist and Speaker at SBIR Conference, Sheraton Hotel, Syracuse University, Mar. 2007.
- 45) Invited Panelist and Speaker at Accelerate 2007, A Syracuse Central New York on New Ideas in Technology, Manufacturing, Energy and the Environment, Apr. 2007
- 44) Invited Lecture, Syracuse University Project Advance (SUPA), Syracuse, Oct. 2007
- 43) Invited Lecture, Syracuse University Project Advance (SUPA), New York City, Nov. 2007.
- 42) Department of Chemistry, SUNY - Albany, Nov. 2007.
- 41) Department of Chemistry, College of Staten Island, Nov. 2007.
- 40) Session Chair, American Chemical Society, Inorganic / Materials Chemistry, Chicago, IL, Spring 2007.

## **2006**

- 39) Department of Physics, Syracuse University, Syracuse, NY, Jan. 2006
- 38) Department of Chemistry, University of Missouri at Rolla, Rolla, MO, Mar. 2006
- 37) The 231st American Chemical Society (ACS) National Meeting, Atlanta, GA, Mar.

2006

- 36) Cornell Nanoscale Facility, Cornell University, Ithaca, NY, Jun. 2006
- 35) Invited Talk (Main Group Chemistry), American Chemical Society, 35<sup>th</sup> Northeast Regional Meeting (NERM), 2006, Binghamton, NY, Oct. 2006
- 34) Invited Talk (Recent Advances in Materials Chemistry), American Chemical Society, 35<sup>th</sup> Northeast Regional Meeting (NERM), 2006, Binghamton, NY, Oct. 2006
- 33) Participant and Invited Talk at Nanocuse Conference, SUNY ESF April 2006
- 32) Department of Chemistry, Utica College, Utica, NY, Nov. 2007
- 31) Department of Chemistry, Lehigh University, Bethlehem, PA, Nov. 2006
- 30) Participant and Invited talk at O'Brien & Gere / Syracuse University /SUNY ESF Technology Day Conference, March 2006.
- 29) Department of Chemistry, Kenyon College, Gambier, OH, 2007.
- 28) Two Oral presentations and 2 Poster presentations at the American Chemical Society National Meeting, Chicago, Spring 2007.
- 27) Invited Speaker at Café Scientifique, "Nanoscience and Nanotechnology: About Little Things but Big Science and Technology" Milton Rubenstein Museum of Science and Technology, Syracuse, NY, February 2007.
- 26) Invited Panelist and Speaker at SBIR Conference, Sheraton Hotel, Syracuse University, March 2007.
- 25) Invited Panelist and Speaker at Accelerate 2007, A Syracuse Central New York on New Ideas in Technology, Manufacturing, Energy and the Environment, April 2007.
- 24) Invited Lecture, Syracuse University Project Advance (SUPA), Syracuse, Oct. 2007
- 23) Invited Lecture, Syracuse University Project Advance (SUPA), New York City, Nov. 2007.
- 22) Department of Chemistry, SUNY - Albany, Nov. 2007
- 21) Department of Chemistry, College of Staten Island, Nov. 2007

## **2005**

- 20) Department of Chemistry, Alfred University, Nov. 2005
- 19) Department of Biomedical and Chemical Engineering, Syracuse University, Nov. 2005

## **Invited Talks as a Graduate Student and Post-doctoral Fellow:**

## **2005**

- 18) Department of Chemistry, SUNY at Binghamton, Jan. 2005
- 17) Department of Materials Science and Engineering, University of Delaware, Feb. 2005
- 16) Department of Chemistry, York University, Canada, Feb. 2005
- 15) Department of Chemistry, Rochester Institute of Technology, Feb. 2005
- 14) Department of Chemistry, University of Iowa, Mar. 2005
- 13) Nanoscience Technology Center, University of Central Florida, Mar. 2005
- 12) Department of Engineering and Applied Sciences, Harvard University, Mar. 2005

- 11) Department of Ceramics and Materials Engineering, Rutgers University, April 2005
- 10) Department of Engineering Sciences and mechanics, Pennsylvania State University, Apr. 2005

#### **2004**

- 9) Department of Chemistry, University of California at Santa Cruz, Feb. 2004
- 8) Department of Chemistry, University of Waterloo, Feb. 2004
- 7) Department of Chemistry, Florida State University, Dec. 2004
- 6) Department of Chemistry, University of Western Ontario, Canada, Jan. 2004
- 5) Department of Materials Science and Engineering, University of California at Berkeley, Apr. 2004
- 4) Department of Chemistry, Arizona State University, Mar. 2004
- 3) Department of Chemistry, Concordia University, Jan 2004

#### **2003**

- 2) Department of Chemistry, Western Michigan University, Dec. 2003

#### **2002**

- 1) Institute for Microstructural Sciences, National Research Council (NRC), Ottawa, Canada, Dec. 2002.

#### **Asefa's Publication Citations**

**Total citations of papers published by Asefa reached to > 2500 with the following being among the most notable ones (Asefa h-index = 20)**

- Asefa, T.; MacLachlan, M. J.; Coombs, N.; Ozin, G. A. "Periodic mesoporous organosilicas with organic groups inside the channel walls" *Nature* **1999**, *402*, 867-871; **Citation increased to 912 times to date.**
- Yoshina-Ishii, C.; Asefa, T.; Coombs, N.; MacLachlan, M. J.; Ozin, G. A. "Periodic mesoporous organosilicas, PMOs: fusion of organic and inorganic chemistry 'inside' the channel walls of hexagonal mesoporous silica" *Chem. Commun.* **1999**, 2539. **Citation increased to 271 times to date.**
- Asefa, T.; Kruk, M.; MacLachlan, M. J.; Coombs, N.; Grondey, H.; Jaroniec, M.; Ozin, G. A. "Novel bifunctional periodic mesoporous organosilicas, BPMOs: Synthesis, characterization, properties and in-situ selective hydroboration-alcoholysis reactions of functional groups" *J. Am. Chem. Soc.* **2001**, *123*, 8520-8530. **Citation increased to 191 times to date.**
- Asefa, T.; MacLachlan, M. J.; Grondey, H.; Coombs, N.; Ozin, G. A. "Metamorphic channels in periodic mesoporous methylenesilica" *Angew. Chem. Int. Ed.* **2000**, *39*, 1808. **Citation reached 186 times to date.**

- Asefa, T.; Yoshina-Ishii, C.; MacLachlan, M. J.; Ozin, G. A. "New nanocomposites: putting organic function "inside" the channel walls of periodic mesoporous silica"  
Source: *J. Mater. Chem.* **2000**, *10*, 1751. *Citation increased to 142 times to date.*

**Citations from Asefas' Publications as PI:**

Asefa, et al.,\* *J. Am. Chem. Soc.* **2008**, *Cited 24 times*

Asefa\* et al., *Angew Chem., Int. Ed.* **2007**, *Cited 68 times*

Asefa\*, et al.,\* *Langmuir*, **2007**, *Cited 24 times*

Asefa\*, at al., *Nano Lett.*, **2008**, *Cited 23 times to date*

Asefa\*, et al., *J. Inorg. Biochem.*, **2008**, *Cited 41 times to date*

**Courses Taught (Rutgers University and Syracuse University)**

***Rutgers University***

<b><i>Semester</i></b>	<b><i>Course (Number &amp; Title)</i></b>	<b><i>Enrollment</i></b>
Spring 2012	CHE 371, Inorganic Chemistry (Undergraduate course)	74

<b><i>Semester</i></b>	<b><i>Course (Number &amp; Title)</i></b>	<b><i>Enrollment</i></b>
Spring 2011	CHE 361, Chemical Bonding (Undergraduate course)	54
Fall 2011	Pharm 155:541, Pharmaceutical Materials Engineering (Graduate and Senior Undergraduate Course)	14

<b><i>Semester</i></b>	<b><i>Course (Number &amp; Title)</i></b>	<b><i>Enrollment</i></b>
Spring 2010	CHE 361, Chemical Bonding (Undergraduate course)	56
Fall 2010	Pharm 155:541, Pharmaceutical Materials Engineering (Graduate and Senior Undergraduate Course)	18

<b><i>Semester</i></b>	<b><i>Course (Number &amp; Title)</i></b>	<b><i>Enrollment</i></b>
Fall 2009	CHE 471/571, Advanced Inorganic Chemistry (Graduate / Undergraduate course)	14

***Syracuse University***

<b><i>Semester</i></b>	<b><i>Course (Number &amp; Title)</i></b>	<b><i>Enrollment</i></b>
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Spring 2009	On Teaching Leave	-
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<i>Semester</i>	<i>Course (Number &amp; Title)</i>	<i>Enrollment</i>
Spring 2008	CHE 116, General Chemistry, Part II	330
Fall 2008	CHE 129, Honors General Chemistry Laboratory	34

<i>Semester</i>	<i>Course (Number &amp; Title)</i>	<i>Enrollment</i>
Spring 2007	CHE 116, General Chemistry, Part II	320
Fall 2007	CHE 129, Honors General Chemistry Laboratory	36
	CHE 615, Inorganic Chemistry, Graduate Course – Nanoscience and Nanotechnology / Materials Chemistry	6

<i>Semester</i>	<i>Course (Number &amp; Title)</i>	<i>Enrollment</i>
Spring 2006	CHE 117, General Chemistry II, Laboratory	352
Fall 2006	CHE103, Chemistry in the Modern World	80
	CHE 615, Inorganic Chemistry, Graduate Course – Nanoscience and Nanotechnology/Materials Chemistry	5

<i>Semester</i>	<i>Course (Number &amp; Title)</i>	<i>Enrollment</i>
Fall 2005	CHE 103, Chemistry in The Modern World	75 students

**Panel Reviews/Judge/ Professional Activities:**

*Session Chair*, Chem Show, Nanotechnology Conference, Basic Chemistry of Green/Bio-Nano Convergence New York City, NY, November 2011.

*Organizer*, Annual Spring Symposium of the Catalysis Society of Metropolitan New York, Local Chapter of the North American Catalysis Society, Spring 2011.

*Ad Hoc Manuscript Reviewer for:* Journal of the American Chemical Society; Nature Materials; Studies in Surface Science and Catalysis; Colloids and Surfaces A; Journal of Colloid & Interface Science; Chemistry of Materials; Angewandte Chemie International Edition; Langmuir; ACS Nano; Nature Chemistry; Journal of Organic Chemistry; Journal of Physical Chemistry C; Journal of Physical Chemistry B; Journal of Physical Chemistry Letters; Journal of Non-Crystalline Solids; Journal of Solid State Chemistry; Journal of Sol-Gel Science and Technology; Chemistry A European Journal; European Journal of Inorganic Chemistry; Microporous and Mesoporous Materials; Applied Catalysis A: Chemical; Chemical Communications; Journal of Materials Chemistry; ACS Catalysis; Journal of Molecular Catalysis A; Catalysis Letters; ChemCatChem; and Journal of Physical Chemistry Letters; 2005-Date.

*Session Chair*, Electron Microscopy Symposium, Rutgers University, Fall 2010.  
Green/Bio-Nano Convergence New York City, NY, November 2011

*Reviewer, Technical Panel, Research Proposals, SBIR, Environmental Protection Agency, Washington, D.C., August 2010.*

*Reviewer, Technical Panel, Research Proposals, STAR Program, Environmental Protection Agency, Washington, D.C., July 2010.*

*Reviewer, Technical Panel, Research Proposals, SBIR, National Science Foundation, Washington, D.C., April 2010.*

*Advisory Board Member, Journal ChemTracts, Inorganic Chemistry, 04/2006–2009.*

*Session Chair, 237<sup>th</sup> American Chemical Society National Meeting, Nanoscience/Materials Chemistry Division, Salt Lake City, UT, March 2009.*

*Reviewer, Technical Panel, Research Proposals, CAREER, Solid State and Materials Chemistry, National Science Foundation, Washington, D.C. November 2009.*

*External PhD Examiner, vant Hoff's Institute of Molecular Sciences, University of Amsterdam, the Netherlands, February 2009.*

*Reviewer, Technical Panel, Research Proposals: Environmental Protection Agency (EPA), Nanotechnology Program, Washington, D.C., September 2009.*

*Reviewer, Technical Panel, Research Proposals: Environmental Protection Agency (EPA), Nanotechnology, Washington, D.C., November 2008.*

*Reviewer, Technical Panel, Research Proposals: Materials World Network, Division of Materials Research, National Science Foundation (NSF), Washington, D.C., March 2008.*

*Reviewer, Technical Panel, Research Proposals: Joint NSF – DFG, Materials World Network (MWN), Bonn, Germany, April 2008.*

*Session Chair, 235<sup>th</sup> American Chemical Society National Meeting, Nanoscience/Materials Chemistry, Inorganic Chemistry Division, New Orleans, April 2008.*

*Session Chair, International Nanoporous Materials Symposium – Nano IV, Vancouver, British Columbia, May 2008.*

*Session Chair, 82<sup>nd</sup> American Chemical Society Colloid and Surface Science Symposium, Raleigh, North Carolina, June 2008.*

*Reviewer Technical Panel – Environmental Protection Agency (EPA), Nanotechnology Program, July 2008.*

*Reviewer, for the Journal of the American Chemical Society, book reviews of “Bio-inorganic Hybrid Nanomaterials: Strategies, Synthesis, Characterization and Applications” Edited by Eduardo Ruiz-Hitzky, Katsuhiko Ariga, and Yuri Lvov, Wiley-VCH, 2008.*

*Participant, Joint Syracuse University and Brookhaven National Laboratory Symposium at Brookhaven National Laboratory, Long Island, in Summer 2008.*

*Participant, New York State Academy of Science Gala, New York City, November 2008.*

*Reviewer Technical Panel – Department of Energy (DoE), Environmental Protection Agency (EPA), and National Science Foundation (NSF), Fate, Transport and Environmental Effects of Engineered Nanomaterials, Washington, D.C., November 2007.*

*Session Chair, 233<sup>rd</sup> American Chemical Society National Meeting, Nanoscience/Materials Chemistry, Inorganic Chemistry Division, Chicago, March 2007.*



*Reviewer Technical Panel (Invited):* Ebbing/Gammon's General Chemistry (8<sup>th</sup> Ed.), Houghton Mifflin, 2007.

*Panel Review,* Graduate Record Examinations (GRE) Subject test in chemistry, Educational Testing Service (ETS), Princeton, NJ; 2006

*Advisory Board Member:* International Symposium on Nanoporous Materials, 2006–Date.

*Consultant –* Antek, Inc. Syracuse, NY (Bio-Fuel Cell Company), 2007–2009.

*Leader,* Team working on New Peer-Led Math-Intensive Tutorial for Gateway Chemistry Courses.

*Reviewer Technical Panel –* Joint NSF – DFG Panel, Bonn, Germany, 2008

*Reviewer, Technical Panel, Research Proposals:* Environmental Protection Agency (EPA), Small Business Innovation Research (SBIR), Nanotechnology Program, Washington, D.C., Sept. 2006.

*Ad hoc Proposal Reviewer:* National Research Council of Canada (2003-2004)

*Presentation Judge,* Chemistry and Biochemistry Graduate Research Conference, Concordia University, Montreal, Canada (11/2004)

**Committee Service:**

- 2011 – Date            Vice-President, Sigma Xi Rutgers Chapter for Faculty and Professional Engineers, Rutgers University at New Brunswick
- 2010 – Date            *Member,* Graduate Admissions Committee, Department of Chemistry and Chemical Biology, Rutgers University at New Brunswick
- 2010 – Date            *Member,* Department Colloquium Committee, Department of Chemistry and Chemical Biology, Rutgers University
- 2010                      Faculty Search Committee, Materials Science and Engineering Department, Rutgers University at New Brunswick
- 2009 – Date            *Member,* Graduate Admissions Committee, Department of Chemical and Biochemical Engineering, Rutgers University at New Brunswick
- 2009 – Date            *Member,* Graduate Recruiting Committee, Department of Chemistry and Chemical Biology, Rutgers University at New Brunswick
- 2009 – Date            *Member,* Graduate Advising Committee, Department of Chemistry and Chemical Biology, Rutgers University at New Brunswick
- 2005 – 2009            *Member,* Graduate Recruiting Committee, Department of Chemistry, Syracuse University
- 2006 – 2009            *Member,* Faculty Council, College of Arts and Sciences

- 2006 – 2009      *Member, Curriculum Committee, Department of Chemistry*
- 2006 – 2006      *Search Committee, Office of Sponsored Programs*
- 2005 – 2009      *Member, Student Advisor for Graduate Students, Department of Chemistry*
- 2008 – 2009      *Faculty Search Committee Member, Condensed Matter Physics, Department of Physics, Syracuse University*
- 2008 – 2009      *Summer Advisor for First Year Students, College of Arts and Sciences*
- 2008 – 2009      *Academic Advisor for First Year Students, College of Arts and Sciences*

**Awarded Research Grants:**

- (1) NSF CAREER Award “*Rationally Designing, Synthesizing and Self-Assembling of Multifunctional, Hybrid Nanostructured Organosilica and Organosilica-Titania Materials for Catalysis*” - As a PI - Awarded

Source: NSF CAREER Development Award Program, National Science Foundation

Total Amount: \$504,000.00

Time Period: 01-Feb-2007 to 01-Feb-2012

- (2) NSF Grant “*Controlled Synthesis of Mesoporous Silicon Oxynitride Ceramics by Nitridization of Mesoporous Organosilicas*”

Source: National Science Foundation (NSF)

Total Award Amount: \$ 220,000

Time Period: 01-June-2008 to 31-May-2011

- (3) NSF American Competitiveness Innovation (NSF-ACIF) Fellowship and Supplemental Award “*Controlled Synthesis of Mesoporous Silicon Oxynitride Ceramics by Nitridization of Mesoporous Organosilicas*”

Source: National Science Foundation (NSF)

Total Award Amount: \$ 40,000

Time Period: 01-March-2011

- (4) NSF NanoEHS Grant “*Structure-Property Studies of Novel Multifunctionally-Doped Core-Shell-Shell Nanomaterials for Improving Efficiency and Stability in Decontamination of Environmental Pollutants*”

Source: National Science Foundation Environmental Health and Safety of Nanotechnology (NanoEHS) Program

Total Award Amount: \$ 325,000

Time Period: 01-August-2011 to 01-July-2014

- (5) NSF Creativity Award *“Novel Core-Shell-Shell Nanostructured Ceramics for Probing Structure – Synergistic (Photo)Catalytic Property Relationships and Efficient Catalysis of Various Reactions”*  
Source: National Science Foundation (NSF)  
Total Award Amount: \$ 220,000  
Time Period: 01-June-2011 to 31-May-2013
- (6) NSF Instrumentation Grant *“Acquisition of a Solid State NMR Spectrometer for Research and Teaching Activities around New Jersey Area”*  
Location: Rutgers University  
Source: National Science Foundation (NSF)  
Total Award Amount: \$ 332,000 (as a Co-PI)  
Time Period: 01-Feb-2010-Date.
- (7) EPA Grant *“Monitoring and Controlling Biofilm Formation in Water: Development of a Platform for Studying Bacterial-Surface Interactions” – as a Co-PI – Awarded*  
Source: Environmental Protection Agency through Syracuse University  
(PI: Y.-Y. Luk)  
Total Award Amount: \$99,770  
Time Period: 01-Jul-2006-30-Jun-2007
- (8) EPA Grant *“Shaped Gold/Silica Core-Shell Nanoparticle Based Intelligent Sensors for Waterborne Pathogens” – as a PI – Awarded*  
Source: Environmental Protection Agency through Syracuse University  
(Co-PI: J. C. Dabrowiak)  
Total Award Amount: \$99,950  
Time Period: 01-Feb-2007-29-Jan-2008
- (9) NSF Instrumentation Grant *“Acquisition of an Atomic Force Microscope and Surface Profilometer for Surface Analysis Facility at Syracuse University”*  
Source: National Science Foundation (NSF)  
Total Award Amount: \$ 300,000 (as a Co-PI)  
Time Period: 01-Sep-2007-Date.
- (10) NY State Grant *“Seed Research on Periodic Mesoporous Titania and Polyaniline in Solar Cells” as a Co-PI - Awarded*  
Source: Empire State Development Corporation  
Total Award Amount: \$300,000

Time Period: 01-Sep-2007-31-Aug-2008

(11) University (Internal) Grant “*Multifunctional nanoporous Materials for Adsorption and Controlled Release of Drugs*”

Agency: (Internal) Syracuse University, Crown Award, Honors Program, Syracuse University for Amy Otuonye, Honors Undergraduate Research

Total Award Amount: \$ 300,000

Time Period: 01-Sep-2007-30-Aug-2008

**Outreach and Other Activities:**

- *Fall 2010, Solid State NMR Spectrometer*

I helped with successful proposal writing and acquiring of a grant from the national Science Foundation for the purchase of the first solid state NMR spectrometer for Rutgers University.

- *Fall 2010, Rutgers Catalysis Research Center*

I helped for the successful establishment of the Rutgers Catalysis Research Center (RCRC) and currently help directing activities of the center.

- *Summer 2010, Discovery Day, Rutgers*

I gave lectures to top high school students and their parents on the field of chemistry and chemical engineering as well as nanoscience and nanotechnology.

- *Summer 2010, Rutgers Governor’s School, Rutgers*

I have mentored 5 high school students do research in summer 2010 in my research lab. The students have presented their work for an audience of over 350 people including their parents. Their research work involved the development carbonic anhydrase enzyme -immobilized nanomaterials for CO<sub>2</sub> sequestration and for environmental remediation application.

- *Summer 2006, Honeywell Summer Science Camp, Syracuse, New York:*

I gave talks and experimental demonstrations for 30 eight-graders at a Honeywell Summer Science Camp by Onondaga Lake over Summer 2006 in collaboration with Dr. Peter Plumley at the Milton J. Rubenstein Museum of Science and Technology (MOST). The lecture was to incite students’ interests with science at the early ages and also to show them how science and technology will benefit the society and help remediation of polluted environments such as the Onondaga Lake watershed. Examples and experimental demonstrations using my research works and new “nanosponges” or

efficient adsorbent materials my research group develops along with colorful solutions (model pollutants) were shown. The students' interest during the event was incredible and over 10 questions, many of which were very interesting, were asked by them.

- *Summer 2006, Junior Café Scientifique at MOST.*

I gave lectures and showed experimental demonstrations for elementary, secondary and high school students and their parents at Junior Café Scientifique at MOST in October, 2006. The event was successful with full capacity attendee from Syracuse and Upstate New York area participated and some very stimulating conversation and interesting questions from the kids were received.

- *Summer 2006 and October 2006. Exhibition at the Milton J. Rubenstein Museum of Science and Technology “Nanosponges” – Efficient Adsorbents for Environmental Remediation, Summer 2006 and October 2006.*

- *Consultant for Antek, Inc., Syracuse, NY:*

I served as a consultant for Antek, Inc., a new start-up Bio-fuel cell start-up company in Syracuse, NY. In collaboration with Antek and Anthony Terrinoni, I am currently working on one STTR proposal and planning to write two more proposals for Phase II SBIR grants from federal agencies and New York State for developing new fuel cell materials and technology.

- *Graduate Recruiting at the American Chemical Society (ACS), National Meeting, Atlanta, March 2006.*

- *Graduate Recruiting at American Chemical Society (ACS), Regional Meeting, Binghamton, October 2006*

- *Graduate Recruiting Talk at Union College, November 2006.*

- *Graduate Recruiting at the American Chemical Society (ACS), National Meeting, Chicago, March 2007.*

- *FanaSys, Inc.:* Asefa worked and helped the foundation of a limited liability company, FanaSys Fiber Optics Inc. with Profs. Dawit Negussey, Phillip Kornreich, and Dr. Tracee Jamison.

### **Research Group Activities / Students Mentored or Being Mentored in Asefa Lab:**

#### **1 Visiting Professor is currently being mentored:**

Prof. Eun Woo Shin (from University of Ulsan, South Korea)

#### **8 Post-doctoral Fellows or Associates have been or are currently being mentored:**

Dr. Zhimin Tao (Currently a joint Research Associate with Prof. Hongjie Dai at Stanford University, Stanford, USA)  
Dr. Yan-Li Shi (Currently at Syracuse University)  
Dr. Randy S. Rarig (Currently working at Pfizer, NY, USA)  
Dr. Yanfei Wang (Currently working at China Petroleum and Petrochemical Engineering Research Institute (CPPEI) in Beijing, China)  
Dr. Ankush Biradar (Currently in India)  
Dr. Jafar Al-Sharab (Currently working with Asefa at Rutgers)  
Dr. Xiaoxin Zou (Currently working with Asefa at Rutgers)  
Dr. Anandarup Goswami (Currently working with Asefa at Rutgers)

**15 graduate students have been or are being advised:**

Dr. Krishna K. Sharma (Completed PhD in 2010 and is currently a Post-Doctoral Fellow at Massachusetts Institute of Technology)  
Richard Mishler (PhD student at Rutgers, deceased in 2011)  
Gang Wang (currently PhD Student at Syracuse)  
Dr. Cole Duncan (Completed PhD in 2010 and is currently a Law Student at Franklin Pierce Law School at University of New Hampshire)  
Rajyalakshmi Vathyam (completed MSc thesis and currently working at Medtronic Inc, Warsaw, Indiana, USA)  
Sayantani Das (Currently a PhD student from Chemistry at Rutgers)  
Saravana Kumar (Currently a PhD student in Germany)  
Archana Biradar (Currently working as Part-Time Researcher in Asefa Lab)  
Yang Wang (Currently a PhD student at SUNY-ESF , Syracuse, NY)  
Saqib Ahmed (Completing a PhD student in Summer 2011; joint student with Prof. Dunbar Birnie group in Materials Science and Engineering Department at Rutgers)  
Rafael da Silva (Currently a PhD student in Department of Chemistry and Chemical Biology at Rutgers)  
Rachit Jain (Currently an MSc student in Department of Chemical and Biochemical Engineering at Rutgers)  
Flavian Patrao (Currently an MSc student in Department of Chemical and Biochemical Engineering at Rutgers)  
Helen Huang (Currently an MSc student in Department of Chemical and Biochemical Engineering at Rutgers)  
Xiaoxi Huang (Currently PhD student in Department of Chemistry and Chemical Biology at Rutgers)

**26 undergraduate students have been or are currently being advised:**

- Amy Otuonye (Currently working at pulmonary group at the National Heart Lung Blood Institute at the National Institute of Health, NIH)
- Robert Buckley (Currently a Graduate Student in Dental School at the

- University of Maryland, College Park, MD)
- Kelley Denton (Currently Teach for America - Vivian T. Thomas Medical Academy and W.E.B Dubois High School and MA student Johns Hopkins University, Teaching Department, Baltimore, MD)
  - Sean Quinlivan (Currently a graduate student at University of California at Riverside),
  - Johanna Weisenbauer (Currently a graduate student at the Technical University of Graz, Austria)
  - Semonti Sinharoy (Was at University of Kansas)
  - Elizabeth Blair (Currently Pharmacy student at University of Pennsylvania)
  - Chauncey Brown (Currently at Syracuse University)
  - Tobias Abel (Currently a graduate student at the Technical University of Graz, Austria)
  - Duncan Dam (Currently a graduate student at Northwestern University)
  - Stephanie Flitsch (Currently a graduate student at the Technical University of Graz, Austria)
  - Muzhi (Luke) Liu (Currently a graduate student at Syracuse University)
  - David Brown (Currently at Rice University)
  - Nicauris Batista (Currently at Syracuse University)
  - Mukund Patel (Currently at Rutgers University at New Brunswick)
  - Stephanie Hayes (Currently a Nursing Student at Johns Hopkins University, Baltimore, MD)
  - Ridhima Oberai (Currently at Syracuse University)
  - Cassidy Henneman (Currently at Syracuse University)
  - Chao Zhang (Currently at Syracuse University)
  - Yulia Yevgenyeva (Currently at Syracuse University)
  - Elisabeth Wondimu (Currently a PhD student at Memorial Sloan-Kettering Cancer Center and Cornell University)
  - Yesha Kathrani (Currently at Rutgers University at New Brunswick)
  - Dhara Patel (Currently at Rutgers University at New Brunswick)
  - Peter Lobaccaro (Visiting summer student from University of Notre Dame and joint student with Prof. Charles Dismukes at Rutgers University at New Brunswick)
  - Tejas Shah (Currently at Rutgers University at New Brunswick)
  - Tahia Haque (Currently at Rutgers University at New Brunswick)
  - Stephanie Jou (Currently at Rutgers University at New Brunswick)

**6 High-school students have been mentored in summer research in Asefa Lab:**

- Bryan Cargill
- Peter Godart
- Nicholas Lavrov
- Nicholas Phillips
- Natenapa "Sonic" Simpkins
- Tiffany Sun

### **Collaborators between 2005-Present**

*Prof. Eric Schiff*, Physics Department, Syracuse University.

*Prof. James C. Dabrowiak*, Chemistry Department, Syracuse University.

*Prof. Mietek Jaroniec*, Kent State University, Kent, OH.

*Prof. Gadi Rothenberg*, Vant Hoff's Institute of Molecular Sciences, University of Amsterdam, The Netherlands.

*Prof. Jerry Goodisman*, Chemistry Department, Syracuse University.

*Prof. Michal Kruk*, College of Staten Island, City University of New York, NY.

*Prof. Jing Li*, Department of Chemistry and Chemical Biology, Rutgers University.

*Prof. Charles Dismukes*, Department of Chemistry and Chemical Biology, Rutgers University.

*Prof. Abdul-Kader Souid*, Department of Pediatrics, University of United Arab Emirates, UAE.

*Prof. Alan Goldman*, Department of Chemistry and Chemical Biology, Rutgers University.

*Prof. Robert Niederman*, Department of Molecular Biology and Biochemistry, Rutgers University.

*Dr. Aurelien Di Pasquier*, Department of Materials Science and Engineering, Rutgers University.

*Dr. Detlef Smilgies*, Cornell High Energy Synchrotron Radiation Source (CHESS), Cornell University.

*Prof. Dunbar Birnie*, Department of Materials Science and Engineering, Rutgers University.

*Dr. Vivek Polshettiwar*, Senior Research Scientist, KAUST Catalysis Center (KCC), KAUST

*Prof. Evgeny Dikarev*, Department of Chemistry, SUNY at Albany.

*Prof. Marina Petrukhina*, Department of Chemistry, SUNY at Albany.

*Prof. Laura Farbis*, Department of Materials Science and Engineering, Rutgers University.