

Lisandra Arroyo-Ramírez, PhD

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SUMMARY

Research scientist with 12+ years of hands-on experience developing experimental methods for the synthesis of materials and their characterization with analytical, electrochemical, microscopy and spectroscopy techniques.

- Consistently discovering and implementing novel solutions to catalyst formulations, meeting research objectives and timelines all within budget. Demonstrated ability to work successfully in interdisciplinary environment.
- **Excellent communication skills**, as proven by *17 peer-reviewed publications* and over *60 presentations* at national and international conferences. Demonstrated success in giving workshops/training for diverse audiences.

RESEARCH EXPERIENCE

University of Pennsylvania, Department of Chemical Engineering Philadelphia, PA
Postdoctoral Researcher 1/2013 – Present

- Synthesized a variety of cutting-edge precious metal-based heterogeneous catalysts for hydrogen production, biofuel production and emission control applications
- Formulated an array of metal core-oxide shell and uniform bimetallic structures with wet-chemistry techniques, and evaluated the catalysts' performance, thermal stability and properties against supported catalysts
- Developed experimental procedures to characterize the catalysts, including: kinetic properties, deactivation, morphology, composition, and the effect of catalyst preparation
- Assembled and repaired instruments and flow apparatus for catalyst characterization and evaluation
- Streamlined research projects by organizing and initiating laboratory protocols for students
- Supervised and provided training on research concepts and techniques; collaborated in teams to complete projects

University of Puerto Rico, Río Piedras Campus, Department of Chemistry San Juan, PR
Research Assistant 9/2005 – 6/2012

- Developed the synthesis of carbon supported bimetallic nanoparticles and evaluated their electrocatalytic activity for PEM fuel cell applications
- Created an experimental setup for the self-assembly of an organometallic precursor over HOPG surface leading the formation of well-defined rings at micro- to nanoscale
- Prepared samples and characterized their structural properties such as morphology, composition, particle size, surface analysis, metals identification and quantification
- Coordinated safety activities in the laboratory: created a chemical inventory, carried out labeling and storage of chemicals in designated areas and promoted the appropriated use and handling of hazardous materials and waste
- Supervised students and provided training on analytical techniques

NASA-URC Center for Advanced Nanoscale Materials San Juan, PR
NASA Johnson Space Center Houston, TX
NASA Microgravity University/Minority Institution Flight Week Program 3/2011 – 6/2011

- Designed, built and tested the experimental hardware according specifications for the parabolic flight
- Developed the protocol to understand an electrochemical processes under microgravity conditions
- Identified cause for significant deactivation of supported nanocatalysts, important for the future fuel cell integration into life support systems

University of Puerto Rico at Cayey, Department of Physics Cayey, PR
Research Assistant 9/2008 – 10/2011

- Implemented sputtering and electrospinning techniques to reduce preparation time of electrocatalysts
- Achieved Pd nanostructure formation with higher surface areas and catalytic activity compared to Pd thin films

OTHER EXPERIENCE

BlueChip Technologies Inc.

Co-Owner and QA Analyst

Caguas, PR

4/2010 – 8/2012

- Provided input on business decisions
- Executed rigorous test on staging code ensuring the quality of each production release
- Successfully generate reports for the development team to solve bugs or issues found

EDUCATION

Ph.D. in Analytical Chemistry

University of Puerto Rico, Río Piedras Campus

6/2012

B.S. in Chemistry

University of Puerto Rico, Río Piedras Campus

6/2004

SELECTED AWARDS

- Postdoctoral Fellowship for Academic Diversity (2013-2016)
- Puerto Rico NASA Space Grant Consortium Fellowship (2010-2012)
- NSF-EPSCoR Institute for Functional Nanomaterials Graduate Fellowship (2009-2010)
- Alliance for Graduate Education and the Professoriate Fellowship (2006-2007)
- Puerto Rico Louis Stokes Alliance for Minority Participation Undergraduate Scholarship (2000-2004)

EXTRACURRICULAR & LEADERSHIP ACTIVITIES

- Puerto Rico Toastmasters Club: Officer (2010-2011), Competent Leader Award, active member (2009-2012)
- Science workshop demonstrations for STEM awareness (various public settings) (2009-2012)
- Alliance for Graduate Education and the Professoriate Mentorship Program: Mentor (2005-2008)

SELECTED PUBLICATIONS

- Onn, T.M.; Zhang, Z.; Arroyo-Ramírez, L.; Chung, Y.-C.; Graham, G.; Pan, X.; Gorte, R.J. “Improved Thermal Stability and Methane-Oxidation Activity of Pd/Al₂O₃ Catalysts by Atomic Layer Deposition of ZrO₂”, **ACS Catalysis**, 2015, 5, 5696.
- Luo, J.; Arroyo-Ramírez, L.; Tzoulaki, D.; Vlachos, D.G.; Gorte, R.J. “Hydrodeoxygenation of HMF over Pt/C in a Continuous Flow Reactor”, **AIChE Journal**, 2014, 61 (2), 590.
- Arroyo-Ramírez, L.; Chen, C.; Cargnello, M.; Murray, C.B.; Fornasiero, P.; Gorte, R.J. “Supported Platinum–Zinc Oxide Core–Shell Nanoparticle Catalysts for Methanol Steam Reforming”, **Journal of Materials Chemistry A**, 2014, 2 (45), 19509.
- Arroyo-Ramírez, L.; Montano-Serrano, R.; Luna-Pineda, T.; Román, F.R.; Raptis, R.G.; Cabrera, C.R. “Synthesis and Characterization of Palladium and Palladium-Cobalt Nanoparticles on Vulcan XC-72R for Oxygen Reduction Reaction”, **ACS Applied Materials & Interfaces**, 2013, 5 (22), 11603.
- Arroyo-Ramírez, L.; Rodríguez, D.; Otaño, W.; Cabrera, C.R. “Palladium Nanoshell Catalysts Synthesis on Highly Ordered Pyrolytic Graphite for Oxygen Reduction Reaction”, **ACS Applied Materials & Interfaces** 2012, 4 (4) 2018.

SKILLS

- **Soft skills:** Bilingual (English/Spanish), strong organizational and interpersonal skills, strong analytical, troubleshooting and problem-solving skills, team player in interdisciplinary environment, proven leadership
- **Microscopy and Spectroscopy:** AFM, STM, FE-SEM, TEM, STEM, XPS, AES, EDS, UV-Vis, FTIR, MS
- **Other:** XRD, TGA, GC, ALD, sputter deposition, electrospinning, profilometer, voltammetry, RDE, RRDE, electrodeposition, flow reactor, CO chemisorption, BET surface area, glove box, Schlenk-line, basic techniques