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PROFESSIONAL EXPERIENCE

8/2017 - present *Assistant Professor*, Howard University (HU), Washington D.C.
1/2018 – 12/2019 *Research Fellow*, Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, Changchun, Jilin, China
9/2016 – 8/2017 *Assistant Professor*, University of Missouri-Kansas City (UMKC), Kansas City, MO
1/2016 – 7/2016 *Postdoctoral Fellow*, Kansas State University, Manhattan, KS
9/2012 – 9/2015 *Postdoctoral Fellow*, University of Jyväskylä, Jyväskylä, Finland
3/2012 – 1/2013 *Postdoctoral Appointee*, Argonne National Laboratory, Argonne, IL
4/2010 – 3/2012 *Postdoctoral Researcher*, University of Jyväskylä, Jyväskylä, Finland
12/2009 – 4/2010 *Research Associate*, Virginia Commonwealth University, Richmond, VA

EDUCATION

2009 Ph.D. Chemistry, Chemical Physics, Virginia Commonwealth University, Richmond, VA
2006 M.Sc. Applied Physics, Virginia Commonwealth University, Richmond, VA
2002 B.Sc. Physical Science, Physics Concentration, Radford University, Radford, VA

GRANTS

9/2018 – 8/2021 National Science Foundation (U.S.A.) 786,178 USD *HBCU-UP EiR: Understanding Interactions of Gold and Silver Nanoparticles with Proteins to Achieve Optimum Surface Plasmon Effect (co-PI)* 18311559
1/2018 – 12/2019 Research Fund for International Young Scientists by National Natural Science Foundation of China (2018 – 2019) 400,000 RMB (~62,000 USD) Grant No. 21750110448, 2018 (PI)
9/2012 – 8/2015 Academy of Finland Postdoctoral Researcher Fellowship 285,000 euros (~330,000 USD) *Computational Design of Organometallic Nanostructured Materials for Energy Applications (PI)*

COMPUTER ALLOCATIONS

01/2019 – 12/2019 NSF/XSEDE Award (TG-CHE180092) (155,913 SU) for project: *Photodynamics and Interfacial Chemistry of Hybrid Organic-Inorganic Nanoparticles with Biologically Relevant Molecules*
6/2018 – 6/2019 Sisu Supercomputer, CSC – IT Center for Science (2,010,000 bu) for project: *Thermodynamic and Kinetic Studies of Electrochemical Reduction of Nitric Oxide (co-PI)*
4/2018 – 4/2019 NSF/XSEDE Award (TG-DMR180027) (50000.00 SU) for course: *A Short Course in Computational Modeling (PI)*
1/2017 – 1/2018 Sisu Supercomputer, CSC - IT Center for Science (2,500,000 bu) for project: *Formation of Multishell Gold Nanostructures in Gas-phase and Aqueous Environments (co-PI)*
3/2016 – 3/2018 Sisu Supercomputer, CSC - IT Center for Science (5,000,000 bu) for project: *Metal Nanoparticles on Oxide Surfaces (co-PI)*

TEACHING EXPERIENCE

CHEM 174 Physical Chemistry Laboratory II, Howard University, Spring 2019, Spring 2020
CHEM 171 Physical Chemistry I, Howard University, Fall 2018
CHEM 279 Advanced Physical Chemistry II, Howard University, Spring 2018, Spring 2019
CHEM 278 Advanced Physical Chemistry I, Howard University, Fall 2017, Fall 2018, Fall 2019

CHEM 173	Physical Chemistry Laboratory I, Howard University, Fall 2017, Fall 2018, Fall 2019
CHEM 211L	General Chemistry Laboratory, UMKC, Spring 2017
CHEM 115L	Elements of Chemistry I Laboratory, UMKC, Spring 2017
CHEM 115	Elements of Chemistry I (General, Organic, and Biological Chemistry), UMKC, Fall 2016
KEMS 409	Materials Modelling, University of Jyväskylä, Spring 2014

ADVISING

Current Graduates: Nia Pollard

Current Undergraduates: Jaquesta Adams, Arianna Boyd, Adebola Adeagbo, Sekou Rowe, Asif Mouhiddin, Kachief Callender, Nyasia Davis

Former Undergraduate and Graduate Students: Zhenhong Chen (B.Sc. 2019 HU), Jayla Morgan (B.Sc. 2018 HU), Alexia Moore (B.Sc. 2018, HU), Nia Pollard (B.Sc. 2018 HU), Sydnei Bullock (B.Sc. 2018, HU), Oluwasheun Bello (2018), Andrew Frojd (M.Sc. 2018 UMKC), Emmi Pohjolainen (Ph.D. JYU), Kyung-Shin Suh (G), Tielyr Creason (B.Sc., 2018 UMKC), Dung Nuygen (B.Sc., 2018 UMKC)

UNIVERSITY AND PROFESSIONAL SERVICE

- *Webmaster* Department of Chemistry, Howard University, August 2017 – Present
- M.S. Thesis Committee Member for Francia Bissereth, Howard University, 2019
- M.S. Thesis Committee Member for Mariam Almedwah, Howard University, 2018
- External Ph.D. Dissertation Committee Member for Sahithi Ananthaneni, Department of Chemical Engineering, College of Engineering, Villanova University, Philadelphia, PA (2018 -present)
- *Department of Chemistry, Search Committee Member*, Howard University, October 2017 – May 2018
- *Co-organizer*, Computational Research at Howard University Symposium, Howard University, April 4, 2018
- Committee on Implementation of New Network (Departmental) Fall 2017 – Spring 2018
- External Ph.D. Dissertation Committee Member for Tamara Lozano Trujillo, Department of Chemical Engineering, College of Engineering, Villanova University, Philadelphia, PA (2018)

PROFESSIONAL AFFILIATIONS and ACTIVITIES

- National Organization of Black Chemists and Chemical Engineers – Member 2018 – current
- American Chemical Society – Member Since 2015
- Co-organizer - Computational Research Symposium at Howard University April 4, 2018
- Reviewer, National Science Foundation
- Reviewer, Department of Energy
- *Advisor*, Howard University National Organization for the Professional Development of Black Chemists and Chemical Engineers Student Chapter 2019 - current
- *Advisor*, Howard University Student Chapter American Chemical Society, January 2018 – January 2019
- University of Maryland, Baltimore (UMB) School of Medicine, Department of Emergency Medicine, *Panel Member on Transgender Patient Health Care*, February 14, 2018

PUBLICATIONS

h-factor: 16 ResearcherID: E-4881-2010 ORCID: orcid.org/0000-0002-0574-0847

Peer Reviewed Manuscripts

31) S. Kenzler, F. Fetzer, C. Schrenk, N. Pollard, A.R. Frojd, A. Z. Clayborne, A. Schnepf “Synthesis and characterization of three multi-shell metalloid gold clusters Au₃₂(R₃P)₁₂Cl₈” *Angewandte Chemie*, 58, 5902-5905 (2019), DOI: 10.1002/aime.201900644

- 30) M. Samieegohar, F. Sha, A. Clayborne, T. Wei, "ReaxFF MD Simulations of Peptide-grafted Gold Nanoparticles" *Langmuir* **35**, 5029-5036 (2019) DOI:10.1021/acs.langmuir.8b03951
- 29) C. Du, X. Liu, G. Ye, X. Gao, Z. Zhuang, P. Li, D. Xiang, X. Li, A.Z. Clayborne, X. Zhou, W. Chen "Balancing the micro-mesopores matters for activity maximization of N-doped carbonaceous electrocatalysts in the oxygen reduction reaction" *ChemSusChem* **12**, 1017-1025 (2019) DOI:10.1002/cssc.201802960
- 28) O. Kysliak, D.D. Nguyen, A.Z. Clayborne, A. Schnepf "[PtZn₂Ge₁₈(Hyp)₈] (Hyp = Si(SiMe₃)₃) – a neutral polynuclear chain compound with Ge₉(Hyp)₃ units" *Inorganic Chemistry*, **57**, 12603–12609 (2018) DOI: 10.1021/acs.inorgchem.8b01757
- 27) Y. Lu, C. Zhang, X. Li, W. Xing, A. R. Frojd, A. Clayborne, W. Chen "Enhanced Electrocatalytic Activity of Au₂₅ clusters by Single Platinum Atom Doping" *Nano Energy* **50**, 316-322 (2018) DOI: 10.1016/j.nanoen.2018.05.052
- 26) S. Kenzler, C. Schrenk, A. R. Frojd, H. Häkkinen, A. Clayborne, A. Schnepf "Au₇₀S₂₀(PPh₃)₁₂: An intermediate sized metalloid gold cluster stabilized by the Au₄S₄ ring motif and Au-PPh₃ groups" *Chemical Communications* **54**, 248-251 (2018) doi: 10.1039/C7CC08014J
- 24) H-J. Chun, V. Apaja, A. Clayborne, K. Honkala, J. Greely "Understanding the Electrochemical Reduction of Nitric Oxide on the Single Crystal Pt(100) Surface: A DFT and Kinetic Monte Carlo Study" *ACS Catalysis*, **7**, 3869–3882 (2017) doi: 10.1021/acscatal.7b00547
- 23) X. Gao, S. He, C. Zhang, C. Du, X. Chen, A. Clayborne, W. Chen "Single Crystal Sub-Nanometer Sized Cu₆(SR)₆⁻ Clusters: Structure, Photophysical Properties, and Electrochemical Sensing" *Advance Science*, **3**: 1600126 (2016). doi: 10.1002/advs.201600126
- 22) A. Clayborne, H-J. Chun, R.B. Rankin, J. Greely "Elucidation of Pathways for NO Electroreduction on Pt(111) from First Principles" *Agnewandte Chemie* **54**, 8255 (2015)
- 21) J. Lindgren, A. Clayborne, L. Lehtovaara "Optical Properties of Aluminum Metalloid Clusters: Time-dependent Density Functional Theory Study" *Journal of Physical Chemistry* **119**, 19539 (2015)
- 20) M. Klinger, C. Schenk, F. Henke, A. Clayborne, A. Schnepf, A. –N. Unterreiner "UV photoexcitation of a Metalloid Ge₉ Cluster: Ultrafast Response in the Solvent Tetrahydrofuran and DFT studies" *Chemical Communications* **51**, 12278 (2015)
- 19) E. Yitamben, A. Clayborne, S. Darling, N. Guisinger "L-Tryptophan on Cu(111): Engineering a Molecular Labyrinth Driven by Indole Groups" *Nanotechnolgy* **26**, 235604 (2015). DOI: 10.1088/0957-4484/26/23/235604
- 18) C. Schrenk, B. Gerke, R. Pöttgen, A. Clayborne, A. Schnepf "First Reactions with a Metalloid Tin Cluster{Sn₁₀[Si(SiMe₃)₃]₄}²⁻: Ligand Elimination vs. Coordination Chemistry" *Chemistry – A European Journal* **21**, 8222 (2015)
- 17) E. Pohjolainen, H. Häkkinen, A. Clayborne "The Role of the Anchor Atom in the Ligand of the Monolayer-Protected Au₂₅(XR)₁₈⁻ Nanocluster" *Journal of Physical Chemistry C* **119**, 9587 (2015) DOI: 10.1021/acs.jpcc.5b01068
- 16) C. Rocha, A. Clayborne, P. Koskinen, H. Häkkinen "Optical and Electronic Properties of Graphene Nanoribbons upon adsorption of Ligand-protected Aluminum Clusters" *Physical Chemistry Chemical Physics* **16**, 3538 (2014)
- 15) A. Clayborne and H. Häkkinen "The Electronic Structure of Ge₉[Si(SiMe₃)₃]₃⁻: A Superantatom Complex" *Physical Chemistry Chemical Physics* **14**, 9311 (2012).
- 14) P.A. Clayborne, O. Lopez-Acevedo, H. Grönbeck, R.L. Whetten, H. Häkkinen "Evidence of Superatom Electronic Shells in Ligand-stabilized Aluminum Clusters" *Journal of Chemistry Physics* **135**, 094701 (2011).
- 13) O. Lopez-Acevedo, P.A. Clayborne, H. Häkkinen "On the Electronic Structure of Ligand protected Gold, Aluminum and Gallium Clusters" *Physics Review B* **84**, 035434 (2011).

- 12) P.A. Clayborne, O. Lopez-Acevedo, H. Grönbeck, R.L. Whetten, H. Häkkinen "Al₅₀Cp*₁₂ Cluster: A 138-electron Closed Shell (L=6) Superatom" *European Journal of Inorganic Chemistry* **17**, 2649 (2011).
- 11) P.A. Clayborne, U. Gupta, J.J. Melko, A.C. Reber, S.N. Khanna, and A.W. Castleman, Jr. "The Applicability of Three Dimensional Aromaticity in BiSn_n⁻ Zintl Analogues" *Journal of Chemical Physics* **133**, 134302 (2010).
- 10) J.J. Melko, P.A. Clayborne, C.E. Jones, Jr., J.U. Reveles, U. Gupta, S.N. Khanna, A.W. Castleman, Jr. "A Combined Experimental and Theoretical Study of Al_nX (n = 1-5, X = As, Sb) Clusters: Evidence of the Jellium Model and Aromaticity" *Journal of Physical Chemistry A*, **114**, 2045 (2010).
- 9) P.A. Clayborne, C.E. Jones, U. Gupta, J.J. Melko, A.W. Castleman, Jr. and S.N. Khanna "Structural Evolution of Trinobium Carbide Clusters: Evidence of Large C_n Chains (n = 3-4) in Nb₃C_n⁻ (n = 5 – 10) Clusters" *Journal of Physical Chemistry A*, **114**, 3 (2010).
- 8) J.U. Reveles, P.A. Clayborne, A.C. Reber, S.N. Khanna, K. Pradhan, P. Sen, M.R. Pederson, "Designer Magnetic Superatoms" *Nature Chemistry* **1**, 310 (2009).
- 7) C.E. Jones, P.A. Clayborne, J.U. Reveles, U.U. Gupta, J.J. Melko, A.W. Castleman, Jr. and S.N. Khanna "Al_nBi Clusters: Transitions Between Aromatic and Jellium Stability" *Journal of Physical Chemistry A* **112**, 51 (2008)
- 6) U. Gupta, A.C. Reber, P.A. Clayborne, J.J. Melko, S.N. Khanna, and A.W. Castleman Jr. "Effect of Charge and Composition on the Structural Fluxionality and Stability of Nine Atom Tin-Bismuth Zintl Analogs" *Inorganic Chemistry* **47**, 23 (2008)
- 5) A.C. Reber, S. Paranthaman, P.A. Clayborne, S.N. Khanna, A.W. Castleman Jr. "From SiO molecules to Silicates in Circumstellar Space: Atomic Structures, Growth Patterns, and Optical Signatures of Si_nO_m Clusters" *ACS Nano* **2**, 1729 (2008)
- 4) K.L. Knappenberger, Jr., P.A. Clayborne, J.U. Reveles, M.A. Sobhy, C.E. Jones, Jr., U. Gupta, S.N. Khanna, I. Iordanov, J. Sofo, and A.W. Castleman, Jr. "Anion Photoelectron Spectroscopy and Density Functional Investigation of Diniobium Carbon Clusters" *ACS Nano* **1**, 4 (2007).
- 3) P. Clayborne, N.O. Jones, A.C. Reber, J.U. Reveles, M.C. Qian, and S.N. Khanna. "Superatoms and their assemblies based on Alkali and Super-alkali Motifs" *Journal of Computational Methods in Sciences and Engineering* **7**, p.417 (2007).
- 2) A.C. Reber, P.A. Clayborne, J.U. Reveles, S.N. Khanna, A.W. Castleman, Jr., and A. Ali. "Origin of Silicate Grains and Silicon Nanoparticles in Circumstellar Environments" *Nanoletters* **6**, 6 (2006).
- 1) P.A. Clayborne, T.C. Nelson, T.C. Devore "Temperature programmed desorption-FTIR investigation of C₁-C₅ primary alcohols adsorbed on γ-alumina" *Applied Catalysis A* **257**, 225 (2004).

Conference Proceedings & Abstracts

- 2) J. Adams, K-S. Suh, G. Guirgis, C. Metz, A. Clayborne, (2019). "Quantum Chemical and Spectroscopic Investigations of Si₃(NH)₃X₆ and Si₃(NH)₃R₆ (X= F, Cl, NH₃; R = H, CH₃, CH₂CH₃) Cyclic Clusters" *Front. Chem. Conference Abstract: National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCChE) 45th Annual Conference* . (2019) doi: 10.3389/conf.fchem.2018.01.00033
- 1) A.W. Castleman, Jr., A.C. Reber, P.A. Clayborne, J.U. Reveles, S.N. Khanna, and A. Ali "Formation of Silicate Grains in Circumstellar Environments: Experiment, Theory and Observations" *NASA Laboratory Astrophysics Proceedings*, Edited by: P.F. Weck and V.H.S. Kwong, (University of Nevada, Las Vegas, 2006), p.144.