**James E. Allen Jr.**

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**EDUCATION**

**Temple University August 2018-August 2024** Ph.D. Inorganic ChemistryPhiladelphia, PA

**Albright College August 2014-May 2018**

B.S. Biochemistry Reading, PA

**TEACHING EXPERIENCE**

**Arcadia University** (Visiting Assistant Professor of Chemistry)

General Chemistry I Lecture Fall 2024

General Chemistry I Lab Fall 2024

Undergraduate Research Mentorship Fall 2024

**Temple University** (Graduate Student)

Undergraduate Researcher Mentorship Spring 2022-Summer 2024

* *Mentored an undergraduate student on the synthesis and characterization of energetic and magnetically switchable materials.*

General Chemistry I Recitation & Lab Fall 2018, Spring 2019, Fall 2022

Physical Chemistry II Recitation Fall 2021 Chemistry of Wine Lecture Fall 2019

* *I was selected as the instructor of record for a course on chemistry of wine as a graduate student.*

Chemistry of Wine Recitation Fall 2019, Fall 2021

**AWARDS & CERTIFICATES**

**Award for Outstanding Teaching by a Graduate Student of the College of Science and Technology** (2021)

**The Teaching in Higher Education Certificate** (2020)

The Center for the Advancement of Teaching and the College of Education, Temple University

**Guy Allen Award for Outstanding Teaching** (2019)

**RESEARCH EXPERIENCE**

**Synthesis, Characterization, and Energetic Properties of Novel Energetic Molecular ClustersJan 19th – Present**

Advisor: Dr. Michael Zdilla Temple University

* Synthesized and energetic ligands and resultant complexes with metals such as manganese, iron, and cobalt.
* Characterized ligand and cluster structure with NMR, XRD, UV-vis, and IR spectroscopy.
* Measured the energetic properties of energetic compounds with bomb calorimetry alongside impact and friction sensitivity tests.
* Tested magnetic field effects on detonation temperature of a selection of manganese-based energetic clusters and coordination polymers.

**Synthesis and Characterization of Guanidine-Based Coordination CompoundsAugust 2016-May 2018**

Advisor: Dr. Nicolas Piro Albright College

* Synthesized guanidine-based ligands and resultant complexes with copper, iron, and zinc under air-free conditions.
* Characterized ligand and coordination complex structures with NMR, XRD, IR, and UV-vis spectroscopy.
* Studied the catalytic capabilities of copper complexes with cyclic voltammetry and tested the efficacy of these complexes to catalyze epoxidation reactions.

**SKILLS & TECHNIQUES**

**Ligand and Coordination Compound Synthesis**

**Air Free Techniques** (Schlenk Line and Glovebox)

**Single Cystal X-Ray Diffraction** (Bruker, APEX, OLEX)

**UV-Vis Spectroscopy** (JASCO)

**Nuclear Magnetic Resonance** (1H and 13C)

**Bomb Calorimetry** (Parr)

**Energetic Sensitivity Tests** (Impact, Friction, ESD)

**Infrared Spectroscopy** (OMNIC)

**PUBLICATIONS**

**5**. **Allen, J. E.**; O'Sullivan, O. T.; Zybin, S.; Morozov, S. I.; Kawamura, C.; Waxler, D. E.; Hooper, J. P.; Goddard, W. A.; Zdilla, M. J. “A high-energy-density molecular magnet with magnetically modulated detonation temperature.” *J. Am. Chem. Soc*., **2024**, 146 (7), 4500-4507. DOI: 10.1021/jacs.3c10621.

**4**.Kornfiend, J.; **Allen, J. E**.; Keller, T.; Fleming, F. “Heterocycles via SiCl4‐Promoted Isocyanide Additions to Oxonitriles.” *J. of Org. Chem.*, **2023**, 88 (22), 15947–15955. DOI:10.1021/acs.joc.3c02210.

**3**. Vazquez‐Lopez, A.; **Allen, J. E**.; Wengryniuk, S. E. “Synthesis of 3‐Aminopiperidines via i(Iii)‐mediated Olefin Diamination with (Hetero)Aryl Nucleophiles.” *Advanced Synthesis & Catalysis* **2023**, *365* (16), 2697–2702. DOI:10.1002/adsc.202300374.

**2**. Stauffer, T. J.; Gehman, Z. M.; **Allen, J. E**.; Piro, N. A. “A Ferrocenyl P/NNN Hybrid Ligand for Binding Soft/Hard Metal Pairs.” *Polyhedron* **2023**, 238, 116412. DOI:10.1016/j.poly.2023.116412.

**1.** **Allen, J. E.**, Kassel, W.S., Piro, N. A. “Synthesis, Structures and Characterization of Complexes Containing a 2,6-Bis(guanidinyl)pyridine Ligand on Iron(II), Cobalt(II), Nickel(II), Copper(I), Copper(II) and Zinc(II).” *Polyhedron***2018**, DOI: 10.1016/j.poly.2018.08.012

**RESEARCH PRESENTATONS**

***Albright College: Invited Talk*,** September 2024, Title:“Structure and Properties of Novel Energetic Coordination Complexes and their Potential as Magnetically Switchable Materials.” Albright College, Reading Pennsylvania.

**Gordon Research Conference: Energetic Materials**, June 2024, Poster Title: “Properties of Novel Energetic Coordination Complexes and their Potential as Magnetically Switchable Explosives.” Newry, Maine.

**Philadelphia Inorganic Colloquium**, April 2023, Poster Title: “Magnetic Field Effects on Detonation Temperature of a High-Energy-Density Inorganic Cluster.” College of New Jersey, Ewing NJ.

**Gordon Research Conference: Inorganic Reaction Mechanisms**, March 2023, Poster Title: “Magnetic Field Effects on Detonation Temperature of a High-Energy-Density Inorganic Cluster.” Galveston TX.

**American Chemical Society National Meeting**, March 2022, Poster Title: “Magnetic Field Effects on Detonation Temperature of a High-Energy-Density Inorganic Cluster***.***” San Diego CA.

**Philadelphia Inorganic Colloquium**, April 2020, Poster Title: “Synthesis and Characterization of Energetic Clusters Containing Manganese-Linked Tetrazolium Salts.”Temple University, Philadelphia PA.

**American Chemical Society National Meeting**, April 2020, Poster Title: “Synthesis and Characterization of Energetic Clusters Containing Manganese-Linked Tetrazolium Salts.”Virtual Meeting.

**Intercollegiate Student Chemist Convention-Penn State Berks**, April 2017, Lecture Title: “A Novel Chelating Guanidine Ligand and Its Complexes with Late Metal Ions: Synthesis and Reactivity.”Reading PA

**Lehigh Valley ACS Regional Meeting**, 2017, Poster Title: “Complexes of 2,6-Bis(1,4,6-triazabicyclooctenyl)pyridine with First-Row Transition Metal Ions.” DeSales University, Center Valley PA.

**COMMUNITY OUTREACH**

**STEAM Night Volunteer** April 2024, Wallingford PA

**George Washington-Carver Science Fair Judge** March 2024, Temple University

**2024 Greater Philadelphia Junior Science and Humanities Symposium Judge** March 2024, Temple University

**George Washington-Carver Science Fair Judge** March 2020, Temple University

**Nether Providence Elementary School Science Fair** November 2019, Wallingford PA

**West Oak Lane Charter School** June 2019, Philadelphia PA

**2019 Greater Philadelphia Junior Science and Humanities Symposium Judge** March 2019, Temple University

**West Oak Lane Charter School** December 2018, Philadelphia PA