

Charles A. Wolfe

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Education:

Hampden-Sydney College- Hampden Sydney, VA
Bachelor of Science in Chemistry, *Summa Cum Laude*

Graduated: May, 2020

University of Texas at Austin: Current
Graduate Research assistant, Teaching assistant

Skills:

Instrumentation: NMR (^{13}C , ^1H), FT-IR, MP-AES, GC-MS, LC-MS, Cyclic Voltammetry, UV Vis, FAAS, DESI, MSP

Synthetic Chemistry: Ester synthesis, Schiff-Base synthesis, Metal Complexing, Biofuel

Techniques: pH Titrations, MP analysis, Absorbance, Flash Chromatography, Distillation

Software: ACD/ChemSketch, Gaussian computational software, Scifinder, Shimadzu QP-2010, JEOL NMR, Agilent 1260 LC/MS

Experience:

Advanced Laboratory Project Hampden-Sydney College May 2019-Current

Synthesis and Investigation of the catalytic properties of $(\text{Cu}^{2+}\text{L})_2\text{M}$ Complexes

- Funded by **Barry Goldwater Scholarship** (\$7500 grant, awarded spring 2019)
- Synthesizing novel symmetric Schiff base ligand-metal complex
- Similar SBL complexes mimic enzyme catecholase
- A family of $(\text{Cu}^{2+}\text{L})_2\text{M}$ complexes will be synthesized where $\text{M}=\text{Mn(II)}$, Fe(III) , and Co(IV)
- Products are characterized using LC/MS, FT-IR, X-ray crystallography, and NMR (for ligands free of bound metals)
- Catalytic activity investigated using: cyclic voltammetry, EPR, mass spectrometric studies, and absorbance studies
- Poster Presentation at SERMACS conference, H-SC founders meeting

Advanced Laboratory Project Hampden-Sydney College January 2019-April 2019

GC/MS Analysis of Soap Residues Deposited on Hand Post-Wash

- Investigated claim made by Unilever that Dove soap does not leave soap "scum" on hands post wash
- Meticulously collected hand washing samples using standardized washing method
- Silylated samples, utilized GC/MS RF (response factors) to identify and quantify deposited residues

Advanced Laboratory Project Hampden-Sydney College August 2018-December 2018

Investigation of Curcumin and Curcumin Radicals Using Fast-Flow Electron Paramagnetic Resonance Spectroscopy

- Investigated Curcumin, the active ingredient in turmeric spice, and its medicinal properties
- Successfully Observed Curcumin radicals using FF-EPR, and novel piperrine radicals using FF-EPR
- Maintained detailed laboratory notebook and had weekly progress report meetings
- Poster Presentation at H-SC founders meeting

Independent Research Project Hampden-Sydney College May 2018-September 2018

Estimating Percent Composition of Biodiesel/ Diesel Blends using MATLAB and GC/MS

- Synthesized canola oil-based Biodiesel using known base catalyzed transesterification method
- Used GC/MS to determine the components of both diesel and biodiesel

Independent Research Project Hampden-Sydney College May 2017-September 2017

Synthesis and Characterization of Mauveine and other Aniline Derivatives

- Synthesized Mauveine, purple dye, from aniline components
- Synthesized various other organic compounds from aniline components
- Characterized the molecules via. NMR, IR, and UV-Vis spectroscopy
- Poster Presentation at H-SC founders meeting

**** Every Advanced Laboratory/ Independent Research Project had an associated lab notebook, in-house formal seminar, poster presentation, and paper****

On-Campus positions:

Instrument Technician Hampden-Sydney College January 2017-Current

- Performed routine maintenance on NMR (inc. N and He fills), IR, GC/MS, LC/MS and MP-AES
- Guided students in interpreting their ^{13}C NMR, ^1H NMR, IR, UV-Vis spectra or MS chromatograms
- Helped manage chemical stockroom when supervisor was unavailable
- Worked with professors to help enrich/streamline laboratories.
 - ex. Training the lab assistants in HSQC 2D NMR

Journal of Sciences (Chief Editor) Hampden-Sydney College September 2018-Current

- H-SC Journal of Sciences aims to publish works completed by H-SC undergraduates
- Releases twice yearly
 - Fall issue (online): A Bio-Ethics Compendium composed of opinion pieces
 - Spring Issue (Print): A journal composed of H-SC undergraduate research projects and feature writers
- Worked with professors to help enrich/streamline laboratories

Accolades:

Barry M. Goldwater Scholarship April 2019

- Established by the United States Congress in 1986 to provide scholarships to STEM undergraduates
- Awarded to 300 college sophomores and juniors nationwide annually
- Based on student proposed, institution endorsed undergraduate research
- Mean applicant GPA: 3.95
- Amount: \$7500

Topham Chemistry Award Hampden-Sydney College April 2019

- Established in honor of H-SC alumnus Dr. Richard W. Topham, founder of the H-SC undergraduate research committee
- Awarded to one H-SC chemistry major annually
- Amount: \$1000

Phi Beta Kappa Honor Society Hampden-Sydney College Inducted as a Junior, April 2019

- Established 1776, making PBK the oldest U.S. academic honor society
- Awarded to the top 10% of students
- Inducted as a Junior (top 5 students become inductees junior year)

Activities:

Alpha Chi Sigma (BX chapter) Professional Chemistry Fraternity March 2017-current

- Alumni Coordinator
 - Worked to keep the alumni of Alpha Chi Sigma up to date on BX chapter activities and events

"Science in a Box" Community Outreach Program September 2019-current

- Outreach program aimed at providing STEM enrichment to local k-12 students
- Developed low cost laboratory procedures and lesson plans
 - Developed simple Acid-Base calorimetry experiment for middle/high school STEM students

Prince Edward County Environmental Molecular Biology Institute (PECEMBI) January 2016-May 2017

- PECEMBI is an outreach program that collaborates with Longwood University to provide a laboratory experience to students at a local high school that would otherwise not laboratory coursework
- Worked as a teacher/lecturer
- Delivered a hands-on approach to the scientific method both at the local High School and at Hampden-Sydney College
- Developed and executed lesson plans with the Faculty Director, Dr. Michael J. Wolyniak

Judge at VA JSHS (Junior Sciences and Humanities Symposium) August 2014-May 2017

- Biology judge for the VA high school level JSHS at Longwood University