Dawson Smith

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Quick-learning student and competent researcher driven by curiosity. Pursuing dual bachelor's degrees in Materials Science and Engineering and Chemistry, and a thesis Master's in Materials Science researching CMC turbine engine coatings. Seeking to use an experience-backed skill set to reduce fuel consumption across the aerospace industry.

EDUCATION

Purdue University, West Lafayette Campus — Anticipated Dec, 2022
Master of Science in Engineering — Materials Science and Engineering

Purdue University, West Lafayette Campus — Anticipated Dec, 2021
Bachelor of Science in Engineering — Materials Science and Engineering
Bachelor of Science — Chemistry
Minor — History

SKILLS

Materials Characterization

- Microstructural analysis by optical microscopy, SEM, EDS. Properties characterization by mechanical tests, DSC/TGA, BET, Goniometry. Materials/chemical characterization via NMR, FTIR, GC-MS, XRD, Raman.

Software Skills

- Microsoft Office, Python, MATLAB, CES Edupack, nanoHUB, Origin, ImageJ, NX v12, Bruker Instruments.

RESEARCH AND INDUSTRY EXPERIENCE

Master's Research – Ytterbium Disilicate Environmental Barrier Coatings — August 2021 – Present
Dr. Rodney Trice / Dr. Michael Titus

Undergraduate Research – Cellulose Nanocrystal Thin Film Fracture — January 2021 – Present
Illuminating Interfacial Mechanics Research Group

- Developing manufacturing procedure for *in situ* observation of cellulose nanocrystal thin film fracture

Materials Engineering Senior Design — August 2020 – May 2021
Rolls Royce/Praxair Surface Technologies

- Optimized heat treatments for Ytterbium Disilicate-based environmental barrier coatings to extend service life of CMC turbine engines using XRD, Raman spectroscopy, SEM analysis, and crystallization modelling
- Led 4-person team in experimental design, acted as a point of contact between team and industrial sponsors

Research and Development Intern — May 2020 – August 2020
Battery Innovation Center (on-site)

- Conducted electrode slurry development to improve battery performance, presented results to clients
- Helped teach a Vincennes University-certified energy storage short course to client companies
- Installed and validated characterization equipment, standardized battery development benchmarks

Undergraduate Research - Synthesis of Energetic Materials — August 2019 – August 2020
Purdue Energetics Research Center

- Developed a single step, safe, environmentally friendly synthesis for a primary energetic, 5-nitrotetrazole
- Spearheaded project including experimental work, data management, and publication writing
- Presented work results in poster format at Purdue's virtual undergraduate research conference in Spring 2020

EXTRACURRICULAR ACTIVITIES/ORGANIZATIONS

Officer/Radio Show Host - *Wiley Radio* — August 2018 – Present
Materials Characterization/Processing Lab TA - *Purdue College of Engineering* — August 2020 – Present
Treasurer - *Purdue Botany Club* — May 2020 – May 2021
Volunteer – *College of Science Global Dialogues, Global Science Partners* — December 2020 – May 2021

PUBLICATIONS

Smith, D.M., Manship, T.D. and Piercey, D.G. (2020), Synthesis of 5-Nitrotetrazole via the direct oxidation of 5-aminotetrazole in a single-pot synthesis. ChemPlusChem 2020, 85(9):2039-2043. doi:10.1002/cplu.202000487

Manship, T.D., Smith, D.M. and Piercey, D.G. (2020), An Improved Synthesis of the Insensitive Energetic Material 3-Amino-5-Nitro-1,2,4-triazole (ANTA). Prop., Explos., Pyrotech.. doi:10.1002/prep.202000097

AWARDS/HONORS

Presidential Scholar — 2018, 2020 – Present
Semester Honors — Fall 2019 – Present
Python, COE Beginner's Coding Certificate — December, 2020
JAFS Japan Study Abroad Scholarship — June 2016 – August 2016