

GEORGE ISSAC PAUL

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Education

Masters of Science, Chemical Engineering, University of California Los Angeles
Lab: Professor Phillipe Sautet Laboratory

September 2024 - Current

Bachelor of Science, Biochemistry, University of California Riverside

September 2019 - June 2023

Relevant Courses: Physical Biochemistry, Advanced Biochemistry Lab, Physical Chemistry

GPA 3.70

- Chancellors Honor Student

Research Experience

Scientist 1, Thermo Fischer, Canoga Park, CA (40hr/week)

November 2023 – September 2024

- Use UV Spectrophotometers and Thermal Cyclers to amplify DNA samples and obtain results for experiments
- Handle biological and chemical reagents in the testing and production of new microbiology devices
- Collect data, document batch records, follow and edit SOPs
- Build experiments, run tests, and collect data utilizing a variety of different softwares.
- Work in Clean room following CGMP guidelines
- Utilize SAP and PANDA softwares to complete tasks
- Grow cells from small scale 1.5ml tubes and harvest at large scale 4-gallon roller bottles for manufacturing needs

Associate Scientist, Bourns College of Engineering UCR, Riverside, CA (25hr/week)

March 2022 – October 2023

- Analyze and interpret TGA graphs to determine molecular composition of products used in future research papers and experiments.
- Designed 3-D schematics and 2-D blueprints of Burner Box utilizing AutoCAD.
- Create and 3-D print 5+ samples on a regular basis for combustion testing.
- Use High Speed Imaging Cameras to conduct combustion imaging, sampling 12-16 fuel rods regularly.
- Synthesize $Mg(IO_3)_2$ via wet lab skills and incorporate into thermite based biological defense systems.
- Test 3 different Iodate based fuels to determine its breakdown and currently working to publish findings.
- Reduce the size of Ammonium Perchlorate from 90 micron to 10 micron which is currently implemented in fuel rods to increase particle heating rate by 35%.
- Conduct research on propulsion and combustion systems and discover how to improve upon them by changing the chemistry of fuel sources.
- Trained to work in hazardous and toxic lab environments in a safe and professional manner.
- Conduct Pressure Cell Tests to obtain analytical data of thermites

Publications

- Yujie Wang, Keren Shi, George Issac Paul, Prithwish Biswas, Michael R Zachariah
Combustion behavior of aluminized metal iodate composites. Part 1: Decomposition mechanism of metal iodates
Combustion and Flame 262, 113372 (2024)
- Yujie Wang, George Issac Paul, Erik Hagen, Haiyang Wang, Michael R Zachariah
Combustion behavior of aluminized metal iodate composites. Part 2: Iodine and energy release rate
Combustion and Flame 262, 113373 (2024)
- Y. Wang, M. Chowdhury, Y. Zhou, G. Issac Paul, K. Shi, M. R. Zachariah, Oscillating-to-Continuous Combustion Transition in Mesoparticle Composites Through Manipulation of Heat Feedback. *Adv. Funct. Mater.* 2024, 2406722. <https://doi.org/10.1002/adfm.202406722>
- Wang, Y., Xu, F., Paul, G. I., Pasos, E. V., Shi, K., Wagner, B., ... & Zachariah, M. R. (2024). Role of Surface Tension on Heat Feedback and Power from Energetic Composites. *ACS applied materials & interfaces*, 16(32), 42100-42108.
- Shi, K., Wang, Y., Paul, G. I., & Zachariah, M. R. (2024). The influence of heat feedback and thermal conductivity on the burn rate of thermite composites. *Combustion and Flame*, 269, 113593. <https://doi.org/10.1016/j.combustflame.2024.113593>

Laboratory Skills

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|---------------------------|---------------------------|----------------------|------------------------------|----------------|
| - IR Spectrometry | - VASP | - 3-D Printing | - Python | - PCC Analysis |
| - TGA Analysis | - Combustion Imaging | - PCR | - DNA Sequencing | - Scipy |
| - SAP | - Cryogenic Ball Mill | - RasTop | - Mass Spectrometry Analysis | |
| - Western Blots | - Particle Size Reduction | - Chemical Synthesis | - Numpy | - MATLAB |
| - Protein Crystallography | | - Pressure Cell Test | | |