

Personal Information

Name: Fredrick Mulei Mutunga
Place of Birth: Kitui, Kenya
Date of Birth: 21st January 1985
Sex: Male
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Research Interests

- Electronic Structure Calculations
- H-atom Tunneling reactions in quantum solids
- Chemical reactions of Cold and ultra-Cold molecules/atoms
- AstroChemistry (current focus is on Saturn's moon, Titan)
- Theory of Chemical Reactions

Education and Qualifications

PhD.:	Physical Chemistry (GPA: 3.7/4.0) <i>University of Wyoming, USA</i> Dissertation: Infrared Spectroscopy, UV Photochemistry, and H-atom Tunneling reactions in Parahydrogen Crystals. These studies involve 193 nm laser photolysis of doped crystals to generate reactive species whose reaction is followed using high resolution Fourier Transform Infrared Spectroscopy (FTIR)	2016
BSc.:	Analytical Chemistry (First Class Honors) <i>Jomo Kenyatta University of Agriculture and Technology, Kenya</i> Research project: Synthesis of Biodiesel from Green Algae. The focus of this project was to study the probability of producing biodiesel from macro-algae species. It involved collection of algae, oil extraction, synthesis and characterization of biodiesel using Gas Chromatography – Mass Spectrometry (GC/MS)	2009
High School:	<i>St. Josephs' Seminary, Mwingi (A -)</i>	2004

Publications

- **F. M. Mutunga**, and D. T. Anderson. Kinetic studies and temperature dependence to the H + N₂O reaction in Solid Parahydrogen (in preparation for submission to the Journal of Chemical Physics)
- L. O. Paulson, **F. M. Mutunga**, S. E. Follett and D. T. Anderson. Reactions of Atomic Hydrogen with Formic Acid and Carbon Monoxide in Solid Parahydrogen I: Anomalous Effect of Temperature. J. Phys. Chem. A, 118, 7640 – 7652 (2014)
- **F. M. Mutunga** and D. T. Anderson. Infrared Spectroscopy and 193 nm Photochemistry of Methylamine Isolated in Solid Parahydrogen. J. Phys. Chem. A, 119, 2420 – 2028 (2014)
- **F. M. Mutunga**, S. E. Follett and D. T. Anderson. H-atom Reactivity as a Function of Temperature in Solid Parahydrogen: The H + N₂O reaction. J. Chem. Phys. 139, 151104 (2013)

Teaching Experience

08/2016 – present: LECTURER; Pwani University, Chemistry Department

- Teaching Physical Chemistry courses and doing research in the area of Theoretical and Computational Chemistry.

08/2012-08/2014: TEACHING ASSISTANT; University of Wyoming, Department of Chemistry

- Lead discussions, Lab experiments and grading in General and Physical Chemistry courses

01/2005-05/2006: TEACHER; Nzuli Secondary School

- Developed positive relationships with students and staff while teaching lessons and evaluating work in subjects including mathematics, physics and chemistry

Industrial Experience

04/2011-08/2012: QUALITY CONTROL MANAGER; Biodeal Laboratories Ltd, Nairobi

- Responsible for utilizing standard guidelines to approve or reject starting and packaging materials, intermediate, bulk and finished products to prevent any non-conformance
- Ensuring testing, validation and calibration processes are carried out to a high standard
- Reviewing and approving sampling instructions, specifications, test methods and other quality control procedures, in addition to approving and monitoring contract analysis
- Checking and maintaining departmental premises and equipment, conducting ongoing quality control training within the team and identifying, recording and resolving any quality control issues

01/2010-04/2011: QUALITY CONTROL ANALYST; Biodeal Laboratories Ltd, Nairobi

- Accurately analyzed finished products, intermediate and raw materials, monitored production processes and effectively resolved any issues in a timely fashion
- Wrote, edited and approved comprehensive standard operating procedures and developed

best practice guidelines for good manufacturing and good laboratory practices

- Developed and validated product and analytical methods
- Conducted training with QC personnel and used knowledge and experience to perform internal audits
- Performed diverse procedures including but not limited to: environmental monitoring, water analysis, process validation and cleaning validation

01/2009-04/2009: RESEARCH AND DEVELOPMENT INTERN; Bidco Oil Refineries Ltd, Thika

- Analyzed soaps, detergents, margarines, baking powder, fats and oils, conducted effluent analysis and treatment, formulated products and performed online inspections of production processes.

Workshops and Conferences

- 2016: International symposium on Molecular Spectroscopy, Urbana–Champaign, Illinois (talk)
- 2015: 249th ACS National Meeting, Denver, CO (poster presentation)
- 2015: 2nd Workshop on Experimental Laboratory AstroPhysics – Kauai, Hawaii (talk)
- 2014: International symposium on Molecular Spectroscopy, Urbana–Champaign, Illinois (talk)
- 2013: OSU international symposium on Molecular Spectroscopy, Columbus, Ohio (talk)
- 2011: Workshop on selected GMP topics for pharmaceutical manufacturers and inspectors, Kenya
- 2011: Workshop on the development and quality control of generic drugs, Tanzania

skills

Instrumental techniques: UHV, Lasers, FTIR, HPLC, UV, GC, GC-MS, NMR, STM | **Programming languages:** Python, MATLAB, Mathematica, Fortran, C/C++ | **OS and Computer programs/codes:** Windows, Unix/Linux, OS X, MS Office, Gaussian, Molpro, Gamess, Psi4 Code

Professional Affiliations

- Member of American Chemical Society (ACS)
- Member of American Physical Society (APS)

References

Professor David Anderson

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