

Oluwasegun Joseph WAHAB

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EDUCATION

University of Warwick, Coventry, United Kingdom. 2022

PhD Chemistry. Thesis title: Single Entity Electrochemical Imaging of Green Energy Materials
[Supervisor – Professor Patrick R. Unwin]

University of Warwick, Coventry, United Kingdom. 2017

MSc Analytical Science and Instrumentation (Distinction - Average: 77.22%)
Thesis title: New Electrochemical Platform for Pathogen Detection. (Score 84%)
[Supervisor – Professor Patrick R. Unwin.]

Federal University of Technology Akure (FUTA) Ondo State, Nigeria. 2014.

B.Tech Industrial Chemistry (First Class Honours: 4.66/5.00, Top 1%)

PROFESSIONAL EXPERIENCES

TEXAS A&M UNIVERSITY, UNITED STATES OF AMERICA

April 2023 – till date: Postdoctoral Research Associate, Department of Chemistry

December 2022 – March 2023: Senior Research Associate, Department of Chemistry

- Developing hybrid nanoelectrochemistry–mass spectrometry methods for single-entity studies
- Engaging scanning probe microscopy to study nanocrystals for energy and biomedical applications
- Coordinating correlative multi-microscopy workflow to characterize wide range of (nano)materials
- Managing SECCM and SEM instrumentations and maintaining relevant safety standards.
- Analyzing data, presenting research results, preparing manuscripts, reports, and proposals.
- Mentoring students and providing advice and assistance to other laboratory team members.

UNIVERSITY OF WARWICK, UNITED KINGDOM

Research Assistant, Department of Chemistry

September 2022 – November 2022

- Developing nanopipette methods to track nucleation events and processes.
- Engaging electrochemical cell microscopy to investigate chemical processes near charged surfaces.
- Managing electrochemical cell microscopy and AFM instrumentations.
- Handling installation and maintenance of equipment and training of personnel on equipment

UNIVERSITY OF WARWICK, UNITED KINGDOM

Doctoral Researcher & Graduate Teaching Assistant, Department of Chemistry

September 2018 – September 2022

- Application of scanning probe nanotechnologies for research applications in energy science
- Analysing large volumes of data into concise graphical summaries using relevant tools
- Reported results of my research in science journals (8 published articles, 1 under revision)
- Communicated my work at 6 conferences (UK & abroad, including an invited RSC lecture)
- Provided hands-on training, maintenance, troubleshooting, and LABVIEW support on scanning electrochemical cell microscopy (SECCM) and scanning ion conductance microscopy (SICM)
- Trained 2 PhD students in instrumental methods: Mr Xiangdong Xu (Marie Curie PhD), and Mr Sebastian Skånvik (visiting student from Aarhus University, Denmark)
- Lab demonstration and grading for postgraduate modules CH914 (Electrochemistry & Sensors) and CH915 (Principles and techniques in quantitative and qualitative)
- Workshop facilitation for year 1 module - CH159 (Mathematics for Chemists)
- Lab demonstration for 9 modules in year 1-2 undergraduate analytical & physical chemistry.

FEDERAL UNIVERSITY OF TECHNOLOGY, AKURE. (FUTA) NIGERIA

Graduate Research and Teaching Assistant, Department of Chemistry

February 2018 - September 2018

- Participate in projects focused on the application of nanocomposites and derivatives of natural resources for the removal of heavy metals in wastewater.
- Contribute to the supervision of undergraduate projects and preparation 3 published papers
- Effectively teach selected topics in CHE202 (Analytical Chemistry I), and CHE315 (Instrumental Methods of Analysis) to 125 students

- Demonstrate practical laboratory sessions in Analytical Chemistry for year 2 students
- Prepare examination questions and grade assessments in UG Analytical Chemistry courses
- Participate in the assessment of industrial training reports and presentations for 87 students

WAZIRI UMARU FEDERAL POLYTECHNIC, BIRNIN KEBBI, KEBBI STATE.

**Graduate Teaching and Research Assistant, Department of Science Laboratory Technology
May 2015 - April 2016.**

- Assist with the development of an improved curriculum for HND-2 laboratory sessions
- Coordinate lab sessions in Analytical and Physical Chemistry for HND-I students
- Aid lecture delivery and coordination of examinations
- Assist senior staff in their research activities and students' project supervision

YALE FOODS LIMITED, OLUYOLE INDUSTRIAL ESTATE, IBADAN, NIGERIA.

June – December 2013: Industrial Trainee

- Conduct physicochemical, microbial, and instrumental quality control analyses of raw materials and food products in line with the GMP. Training in factory utility and wastewater treatment
- Participate in product and process improvement to increase quality and/or reduce cost
- Conduct well-articulated research that led to a 7% cheaper production cost, saving the company millions of naira in the long term.

AWARDS

- 2024-2029: Rowland Institute Fellows Program, Harvard University.
- 2024-2027: Miller Postdoctoral Scholar Award, University of California, Berkeley (\$321,000) (Declined)
- 2023: Science Engineering and Medicine Faculty Thesis Prize, University of Warwick. UK (£500)
- 2020: Best Poster Prize, Chemistry Postgraduate Symposium, University of Warwick. UK.
- 2019: Travel Bursary, Royal Society of Chemistry Analytical Bioscience Group (£500)
- 2018: WEIG Top-up Scholarship for Overseas PhD Student, University of Warwick (£2,000)
- 2018: Warwick Chancellor's International Scholarship, University of Warwick. (£117,000)
- 2016: Warwick Chemistry Overseas Taught Masters Scholarships, University of Warwick. (£4,000)
- 2016: Commonwealth Scholarship, Commonwealth Scholarship Commission UK (£35,486)
- 2014. Best Graduating Student. Chemistry Department, Federal University of Technology, Akure.
- 2014: Dr A. F. Adeyekun Award. Graduating Chemistry Student with the Highest CGPA, FUTA
- 2014: Best Undergraduate Project, Chemistry Department, FUTA, Nigeria.
- 2011-2014: National Merit Scholarship. Federal Government of Nigeria. (₦450,000)

PUBLICATIONS

1. **Recent developments in single-entity electrochemistry.** L. Zhang, **O. Wahab**, A. A. Jallow, Z. J. O'Dell, T. Pungsrilai, S. Sridhar, K. L. Vernon, K. A. Willets, & L. A. Baker. *Anal. Chem.* **2024**, 96, 20, 8036–8055.
2. **Proton and molecular permeation through the basal plane of monolayer graphene oxide.** Z. Wu,[#] P. Sun,[#] **O. Wahab**,[#] Y. Tao, D. Barry, D. Periyangounder, P. Pillai, D. Qing, R. Nair, E. Daviddi, P. Unwin, A. Geim, M. Lozada-Hidalgo. *Nat. Commun.* **2023**, 14, 7756. [#] equal contribution
3. **Proton transport through nanoscale corrugations in two-dimensional crystals.** **O. Wahab**,[#] E. Daviddi,[#] P. Z. Sun, E. Griffin, A. W. Colburn, D. Barry, M. Yagmurcukardes, F. Peeters, A. Geim, M. Lozada-Hidalgo, & P. Unwin. *Nature.* **2023**, 620, 782–786. [#] equal contribution
4. **Thousand-fold increase in O₂ electroreduction rates with conductive MOFs.** R. Mariano, **O. Wahab**, J. Rabinowitz, J. Oppenheim, T. Chen, P. R. Unwin, M. Dincă. *ACS Central Science.* **2022**, 8 (7), 975–982.
5. **Screening surface structure-electrochemical activity relationships of Cu electrodes under CO₂ electroreduction conditions.** **O. Wahab**, M. Kang, E. Daviddi, & P. R. Unwin. *ACS Catal.* **2022**, 12, 6578–6588.
6. **Nanoscale Visualization of Electrochemical Activity at Indium Tin Oxide Electrode.** **O. Wahab**, M. Kang, G. Meloni, E. Daviddi, and P.R. Unwin. *Anal. Chem.* **2022**, 94, 4729–4736
7. **Let's twist Electrochem.** **O. Wahab**, and P.R. Unwin. *Nat. Chem.* **2022** 14 (3), 248-250
8. **Microstructural Origin of Locally Enhanced CO₂ Electroreduction Activity on Gold.** R. Mariano, M. Kang, **O. Wahab**, I. McPherson, J. Rabinowitz, P. Unwin, M. Kanan. *Nat. Mat.* **2021**, 20, 1000–1006.

9. **Electrochemical Impedance Measurements in Scanning Ion Conductance Microscopy.** V. Shkirskiy, M. Kang, I. McPherson, C. Bentley, **O. Wahab**, E. Daviddi, A. Colburn, P. Unwin. *Anal. Chem.* **2020**, 92, 18, 12509–12517.
10. **Scanning Electrochemical Cell Microscopy: A Natural Technique for Single Entity Electrochemistry.** **O. Wahab**, M Kang, P Unwin. *Curr. Op. in Elec.* **2020**, 22, 120-128.
11. **Surface Structure and Grain Boundary Effects on the Oxygen Evolution Reaction at Gold Electrodes.** X. Xu, M. Kang, E. Daviddi, W, Geoff, **O. Wahab**, and P. R. Unwin. (*In preparation*)
12. **Enhancement of Physical and Mechanical Properties of *Dioscorea dumetorum* Starch Films with Dialdehyde Starch Solution.** Olugbenga O., Temitayo F., **Wahab O.**, Idahagbon N. *Starch – Stärke (Wiley)*. 2018, 70, 1700148.
13. **Adsorption Studies of Cu²⁺ from Aqueous Solutions Using Unmodified and Citric Acid – Modified Plantain (*Musa paradisiaca*) peels.** Aderibigbe A., Ogunlalu O., **Wahab O.**, Oluwasina O., Amoo I. *Am. Sci. Res. J. Eng. Technol. Sci.* **2017**,32, 64-78.
14. ***Discorea dumetorum pax* as an Alternative Starch Source for Industrial Applications.** Olugbenga O., **Wahab O.**, Queendaline U., Nwosa O. *IOSR J. Appl. Chem.* **2017**, 10, 5-13.
15. **Physicochemical properties of cassava and starch-keratin prepared biofilm.** Olugbenga O., Queendaline U., Sunday O., **Wahab O.** *Songklanakarinn J. Sci. Technol.* **2016**, 38, 349-355.

PROFESSIONAL AFFILIATIONS

- Member, The Electrochemical Society (ECS). ID: 431059
- Member, the Society for Electroanalytical Chemistry (SEAC). ID: 1397
- Member, International Society of Electrochemistry (ISE). ID: 18641
- Member, Royal Society of Chemistry (MRSC). License: 635625

ORAL AND POSTER PRESENTATIONS

- **Towards Interfacing Nanoscale Electrochemistry with Mass Spectrometry**
Oral presentation. 2nd Texas Electrochemistry Round-Up.
The University of Texas, Austin, Texas. United States. **11th August, 2023.**
- **Mapping the Nanoscale Heterogeneity of Electrodes for Green Energy Applications**
Oral presentation at 2020 Chemistry Postgraduate Symposium
University of Warwick, United Kingdom. **26 May 2021.**
- **Nanoscale Electrochemical Imaging on Electrocatalysts for Green Energy Applications**
Invited RSC Lecture. Distinguished Seminar Series: Breaking Barriers.
University of Warwick, United Kingdom. **29 October 2020.**
- **Visualization of CO₂ Electroreduction Activity of Polycrystalline Copper**
Poster. 2020 Chemistry Postgraduate Symposium. University of Warwick, UK. **27 May 2020.**
- **Towards Antibiotic Susceptibility Testing with Scanning Ion Conductance Microscopy**
Poster. ISE 70th Annual Meeting, Durban, South Africa. **4-9 August 2019.**
Bacteria vs. Antibiotics: Deciding who wins with SICM
- Poster. Midlands Electrochemistry Group Meeting. Loughborough, UK. **3 April 2019.**
- Poster. 2nd Bio-Electrical Engineering Workshop. University of Warwick, UK. **28 March 2019.**

VOLUNTEER/LEADERSHIP POSITIONS

UNIVERSITY OF WARWICK, UNITED KINGDOM

First Aider, Warwick First Aid Society – St John Ambulance. 2018 – 2021

Volunteer Attendant, Coventry Foodbank. 2018 – 2021

Course Rep and Secretary, Chemistry PGSSLC (Postgraduate Student Staff Liaison Committee). 2018-19

Student Representative on Chemistry Safety Committee. 2018-2019

NATIONAL YOUTH SERVICE CORPS (NYSC), NIGERIA

Volunteer, Drug-Free Society and Quality Control Club, Kebbi State. 2015 – 2016.

Academic Secretary, Deeper Life Corpers Fellowship, Kebbi state. 2015 – 2016.

General Secretary, Polytechnic Corpers Association. 2015 – 2016.

REFEREES

Available on request