

Dr. Stephen Nzioki Mailu, PhD

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Sex: Male **Nationality:** Kenyan

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Languages Spoken: English, Kiswahili and Kikamba

EDUCATION:

- ❖ PhD in Chemistry (Electroanalytical Chemistry) (2013) from University of the Western Cape (UWC), South Africa
- ❖ MSc. in Chemistry (Electroanalytical Chemistry) (Cum Laude) (2011) from University of the Western Cape, South Africa
- ❖ B.Ed. (Sci.), Mathematics and Chemistry (Chemistry Major) (First Class Honours) (2007) from Kenyatta University, Kenya.

PUBLICATIONS:

- Milua Masikini, **Stephen N. Mailu**, Abebaw Tsegaye, Njagi Njomo, Kerileng M. Molapo, Chinwe O. Ikpo, Candice Rassie, Lindsay Wilson, Priscilla G. L. Baker and Emmanuel I. Iwuoha, A Fumonisin Immunosensor Based on Polyanilino-Carbon Nanotubes Doped with Palladium Telluride Quantum Dots, *Sensors*, **2015**, 15, 529-546.
- B.T. Sone, **S.N. Mailu**, T. Malwela, E. Coetsee, H.C. Swart, E.I. Iwuoha and M. Maaza, Electrochromism in Self-Assembled Porous Thin Films of Hexagonal Tungsten Trioxide Microspheres Prepared by Aqueous Chemical Growth, *International Journal of Electrochemical Science*, **2014**, 9, 2867-2881
- Milua Masikini, **Stephen N. Mailu**, Chinwe O. Ikpo, Njagi Njomo, Tesfaye T. Waryo, Priscilla G. L. Baker and Emmanuel I. Iwuoha, In - situ Electrochemical Synthesis, Microscopic and Spectroscopic Characterisations of Electroactive poly(2,5-dimethoxyaniline) – Multi-Walled Carbon Nanotubes Composite Films in Neutral Media, *International Journal of Electrochemical Science*, 9, **2014**, 7003 – 7020.
- Natasha Ross, Emmanuel I. Iwuoha, Priscilla Baker, Njagi Njomo, **Stephen N. Mailu**, Milua Masikini, Nolubabalo Matinise, Abebaw Tsegaye, Noluthando Mayedwa, Tesfaye Waryo, Kenneth I. Ozoemena, Avril Williams, Amplification of the discharge current density of Lithium-ion batteries with spinel phase $\text{Li}(\text{PtAu})_{0.02} \text{Mn}_{1.98}\text{O}_4$ nanomaterials, *Electrochimica Acta*, **2014**, 128, 178-183.

- Njagi Njomo, Tesfaye Waryo, Milua Masikini, Chinwe O Ikpo, **Stephen N. Mailu**, Oluwakemi Tovide, Natasha Ross, Avril Williams, Christopher E. Sunday, Priscilla G.L Baker, Kenneth I. Ozoemena, Emmanuel I. Iwuoha, Graphenated tathalum (IV) oxide and poly(4-styrene sulphonic acid) doped polyaniline nanocomposite as cathode material in material in an electrochemical capacitor, *Electrochimica Acta*, **2014**, 128, 226-237.
- Kerileng M. Molapo, Peter M. Ndangili, Rachel F. Ajayi, Gcineka Mbambisa, **Stephen N. Mailu**, Njagi Njomo, Milua Masikini, Priscilla Baker and Emmanuel I. Iwuoha, Electronics of Conjugated Polymers (I): Polyaniline, *International Journal of Electrochemical Science*, **2012**, 7, 11859 – 11875.
- Abd A. Baleg, Nazeem M. Jahed, Omotayo A. Arotiba, **Stephen N. Mailu**, Nicolette R. Hendricks, Priscilla G. Baker and Emmanuel I. Iwuoha, Synthesis and Characterization of Poly(propylene imine) Dendrimer – Polypyrrole Conducting Star Copolymer. *Journal of Electroanalytical Chemistry*, **2011**, 652, 18-20.
- Peter M. Ndangili, Rasaan A. Olowu, **Stephen N. Mailu**, Fanelwa R. Ngece, Priscilla G.L. Baker, Emmanuel I. Iwuoha, Impedimetric Response of a Label-Free Genosensor Prepared on a 3-Mercaptopropionic Acid Capped Gallium Selenide Nanocrystal Modified Gold Electrode. *International Journal of Electrochemical Science*, **2011**, 6, 1438 – 1453.
- Faiza J. Iftikhar, Priscilla G.L. Baker, Peter M. Ndangili, **Stephen N. Mailu**, Emmanuel I. Iwuoha, Modulation of the interfacial electrochemistry of surfactant-functionalised polypyrrole chemical sensor systems. *Electrochemical Acta*, **2011**, 56 (14), 5214-5221.
- Rachel F. Ngece, Natasha West, Peter M. Ndangili, , Rasaan A Olowu, Avril Williams, Nicolette Hendricks, **Stephen Mailu**, Priscilla Baker, Emmanuel Iwuoha, A silver Nanoparticle/Poly (8-Anilino-1-Naphthalene Sulphonic Acid) Bioelectrochemical Biosensor System for the Analytical Determination of Ethambutol. *International Journal of Electrochemical Science*, **2011**, 6, 1820 – 1834.
- Rasaan A Olowu, Avril Williams, Peter M. Ndangili, Rachel F Ngece, **Stephen N Mailu**, Priscilla Baker, Emmanuel Iwuoha, Impedimetry and microscopy of electrosynthetic poly(propylene thiophenimine)-co-poly(3,4 ethylene dioxythiophene) dendritic star copolymer, *International Journal of Electrochemical Science*, **2011**, 6, 1855 – 1870.
- **Stephen N. Mailu**, Tesfaye Waryo, Peter M. Ndangili, Fanelwa R. Ngece, Abd A. Baleg, Priscilla G. Baker, Emmanuel I. Iwuoha, Determination of Anthracene on Ag-Au Alloy Nanoparticles/Overoxidized-Polypyrrole Composite Modified Glassy Carbon Electrodes, *Sensors*, **2010**, 10, 9449-9465.
- Rasaan A. Olowu, Omotayo Arotiba, **Stephen N. Mailu**, Tesfaye T. Waryo, Priscilla Baker, Emmanuel Iwuoha, Electrochemical Aptasensor for Endocrine Disrupting 17 β -Estradiol Based on a Poly(3,4-ethylenedioxythiophene)-Gold Nanocomposite Platform, *Sensors*, **2010**, 10, 9872-9890
- Rachel Ngece, Nicolette Hendricks, Natasha West, Peter M. Ndangili, Abongile Jijana, **Stephen Mailu**, Tesfaye Waryo, Priscilla Baker, Emmanuel Iwuoha. A silver nanoparticles-poly (8-anilino-1-naphthalene sulphonic acid) bioelectrochemical sensor system for the analytical determination of ethambutol, In V. Rajendra, B. Hillbrands, P. Prabu and K.E. Geckeler (eds.): *Biomedical Applications of Nanostructured Materials*, Macmillan Publishers India Limited, **2010**, Pages 269-274. (**Book Chapter**)

- **Stephen N. Mailu**, Masikini Milua, Priscilla G. Baker and Emmanuel I. Iwuoha. Highly Sensitive Hydrazine Electrochemical Sensor Based on Pt(100)Rh Nanoalloys Modified Glassy Carbon Electrode, International Journal of Electrochemical Science, **2017 (Accepted)**

CONFERENCE PRESENTATIONS

Stephen N. Mailu, Priscilla G. Baker and Emmanuel I. Iwuoha, Determination of Water Pollutants Based on Nanoalloys, University of Kabianga's 1st International Conference at Kericho Tea Hotel, Kericho, Kenya, 26th – 28th October, **2016**.

Stephen N. Mailu, Priscilla G. Baker and Emmanuel I. Iwuoha, Development of Preferentially Oriented Pt(100) nanoalloy Electrocatalysts for the Next Generation Fuel Cells, Faculty of Science Postgraduate Research Open Day, University of the Western Cape (UWC), South Africa, 30st October, **2013. (Won a price as the 2rd best oral presenter – Doctoral category)**

Stephen N. Mailu, Priscilla G. Baker and Emmanuel I. Iwuoha, Facile Synthesis and Characterisation of Novel Pd-Au-Ag Nanoclusters and their Application as Electrocatalysts for Ammonia Oxidation, 63rd Annual Meeting of the International Society of Electrochemistry (ISE), Prague, Czech Republic, 19-24th August, **2012**.

Stephen N. Mailu, Priscilla G. Baker and Emmanuel I. Iwuoha, Synthesis, Characterisation and Application of Novel (100) Preferentially Oriented Platinum Nanoalloys for Direct Ammonia Fuel Cells, 2rd International symposium on Electrochemistry, Electrochemistry for energy, African Routes Conference Centre, University of the Western Cape (UWC), South Africa; 19-20th July, **2012**.

Stephen N. Mailu, Priscilla G. Baker and Emmanuel I. Iwuoha, Reactivities of novel ultrasensitive symmetrical Pt(100) nanoalloy systems in ammonia oxidation, Faculty of Science Postgraduate Research Open Day, University of the Western Cape (UWC), South Africa, 31st October, **2012**.

Stephen N. Mailu, Priscilla G. Baker and Emmanuel I. Iwuoha, Production of Hydrogen in Alkaline Media Via Ammonia Electrolysis, Young SACI Symposium, University of the Western Cape (UWC), South Africa, 24th -25th November, **2011**.

Stephen N. Mailu, Priscilla Baker, Emmanuel Iwuoha, Amperometric detection of anthracene based on bimetallic nanoparticles/nanostructured overoxidized-polypyrrole composite, Stellenbosch University, South Africa, International conference on Analytical Sciences (Analytica 2010), 5th-9th Dec. **2010**.

Stephen N. Mailu, Priscilla Baker, Emmanuel Iwuoha, Simultaneous amperometric detection of anthracene and phenanthrene base on Ag-Au nanoalloy/polypyrrole composite, Young SACI Symposium, University of Cape Town (UCT), South Africa, 25th Nov. **2010**.

Stephen N. Mailu, Priscilla Baker, Emmanuel Iwuoha, Electrochemical Sensor for Anthracene based on Ag-Au alloy nanoparticles/overoxidized-polypyrrole composite, 10th International symposium on 'Kinetics in Analytical Chemistry' Fountains Hotel,

Cape Town, South Africa. 2nd-4th Dec. **2009**. (Won a price as the 3rd best poster presenter)

WORKSHOPS:

1. Experts Workshop on Sustainable Use of Water Resources, Maseno University, Kisumu – Kenya; a plenary speaker on Determination of Highly Carcinogenic Polyaromatic Hydrocarbons and Hydrazine in Water Based on Nanoalloys as a plenary speaker, 4th – 7th July, **2016**
2. Research, Innovation and Technology at Machakos University Hotel and Conference Centre, Machakos, 15th – 16th September, **2016**
3. Electrochemsa Workshop IV: International workshop on electrochemical microscopy and spectroscopy, Nelson Mandela Metropolitan University - Port Elisabeth, South Africa; Organized by ElectrochemSA and South African Chemical Institute (SACI), 21st-22nd Feb. **2011**.
4. South African Raman Workshop, University of Pretoria, South Africa, 27th -28th November, **2012**.
5. Course training on Fluorescence Microscopy at Stellenbosch University, South Africa, on 7th July, **2011**
6. Course training on Chemical Safety Training at University of the Western Cape, South Africa, on 19th November, **2009**

FUNDED RESEARCH PROJECTS:

2014 – 2016: NRF Freestanding Post-Doctoral Fellowship Award, University of the Western Cape, South Africa (R585, 000; (KShs. 5.85 Million)

2011-2013: National Research Foundation (NRF) scholarship for PhD, University of the Western Cape, South Africa (R270, 000; (KShs. 2.7 Million)

2009 – 2010: National Research Foundation (NRF) scholarship for MSc, University of the Western Cape, South Africa (R120, 000; (KShs. 1.2 Million)

HONORS AND AWARDS

- 3rd best poster presentation award; 10th International symposium on 'Kinetics in Analytical Chemistry' Fountains Hotel, Cape Town, South Africa. 2nd-4th Dec. **2009**.
- 2nd best oral presentation award; Faculty of Science Postgraduate Research Open Day, University of the Western Cape (UWC), South Africa, 30st October, **2013**

MEMBERSHIP

2016 – Present: - Kenya Chemical Society (KCS) – **Member**

2009 – Present: - South African Chemical Institute (SACI) – **Member**

2009 – Present: – International Society of Electrochemistry (ISE) – **Member**

2007 – Present: - Kenyatta University Alumni Association

2011 – Present: - University of the Western Cape Association

DESIGNATION:

Currently a **Lecturer of Physical/Analytical Chemistry**, Department of Physical Sciences, School of Pure and Applied Sciences, Machakos University

PREVIOUS DESIGNATION:

Lecturer of Physical/Analytical Chemistry, Maseno University (2013-2014).

Assistant Lecturer of Physical Chemistry, University of the Western Cape (South Africa) (2011-2013).

ADMINISTRATION:

The Ag. Dean, School of Pure and Applied Sciences, Machakos University (April, 2017 – to date)

PREVIOUS POSITIONS HELD:

Chairman, Department of Physical Sciences, School of Pure and Applied Sciences, Machakos University (May, 2015 - March, 2017)

Examinations/Timetabling Coordinator, Department of Physical Sciences, Machakos University (Jan. – April, 2015)

Departmental representative (Chemistry), post-graduate committee, Maseno University, (2013-2014)

OTHER RESPONSIBILITIES:

Chemistry External Proposal Reviewer (2016-); National Research Fund – Kenya,

External Proposal Reviewer (2016-); Kenyatta University Vice-Chancellor's Research Grant

External Examiner (2016 –); Remarking of examination scripts, Department of Chemistry, South Eastern Kenya University

Board of Management (BOM) Member; Matiku Secondary School and Kyemundu Secondary School

TEACHING AREAS:

Physical Chemistry, Analytical Chemistry, Nanochemistry and Electrochemistry

RESEARCH INTERESTS:

Synthesis, Characterization and Application of Nanomaterials (Nanoalloys) in Sensing and Electrocatalysis

SUPERVISION:

Currently supervising two (2) master's students and one (1) PhD student