

Curriculum Vitae

Personal Details

Name: Dr. Immaculate Nyambura Michira
Date of Birth: Adult
Marital status: Married

Education Background

-Loreto secondary school, Kiambu, 1984, 1st division, 17 points
-Kabare Girls' High School, Kerugoya, 1986, 3 principles, 1 subsidiary
-Kenyatta University, Nairobi, 1990, Bed. (Maths, Chemistry) Upper second
-Nairobi University, Nairobi, 2000, MSc. (Chemistry)
-University of Western Cape, CapeTown, 2007, PhD, Physical chemistry & Electrochemistry

Teaching Experience

2005-2007: Tutor/demonstrator in chemical sciences, University of Western Cape, South Africa
2008: Lecturer, physical/analytical chemistry, Masinde Muliro University
2009-to date: Lecturer, physical chemistry, University of Nairobi

Courses Taught

Undergraduate: General and Physical Chemistry (SCH 103); Chemical Kinetics and electrochemistry (SCH 204); Physical Chemistry II and Phase equilibria (SCH 303); Statistical thermodynamics (SCH 308); Advanced Electrochemistry and Chemical Kinetics (SCH 403);
Post graduate (MSc.): Recent methods of instrumental analysis (SCH 811, Masinde Muliro)

Research Experience

2011-to date: Synthesis, characterization of Silver/Fe nanocatalysts in TB drug analysis and in degradation of organic dyes in industrial effluents

2009-2011: Fourth year Project Supervision on determination of Levels of fluoride in ground waters, vegetables and soils in Kitengela, Athi-River Regions

2008-2011: Ongoing supervision on work on conducting polymers application to sensors and batteries

2006-2007: Undergraduate and Honors student project supervision in the Sensor Research Lab. CapeTown , South Africa

2005-2007: Research in biosensor Technology at the University of Western Cape, South Africa

1995-2000: Research on trace gas emissions from biomass cookstoves and implications on the national GHG budget

Research Areas

- Sensors (Biosensors and Chemical sensors, optical sensors)
- conducting polymers, metallic nanostructures and Applications in Nanotechnology
- Enzymatics and other macromolecules; Applications of electroanalytical Chemistry.
- Environmental trace metal/fluoride Analysis
- TB -drug monitoring

Examination and Supervision Experience

- - Internal examiner, PhD Thesis, "Modified Electrodes in the study of Selected Pharmaceutical Drugs" by Claire Nineza
- Flouride Levels in Boreholes water in Kitengela and Athi-river regions (2011), Fourth year project by John Kinyanjui
- Synthesis and Characterisation of Silver nanoparticles and their Applications in TB nanobiosensors, Thesis submitted for Msc, Moses Oyagi Ondabu
- Green Synthesis of Iron Nanoparticles and their Applications in the degradation of organic contaminants and their Synergistic effects on Conducting Polymers, Thesis submitted for Msc, David M Katithi

- Green Synthesis and antimicrobial activity of silver nanoparticles from Moringa Oleifera Leaf and Jatropha Curcas extracts by Joshua Sila Munyao (On-going)
- Development of a biosensor for Bisphenol A through electrical analytical methods by Linet A Ogalo (On-going)

Other Experience

- 2011: Referee on behalf of the National Research Foundation (NRF, South Africa) on Research Proposal, " PEM Catalyst development. Development and characterization of polymer electrode membrane (PEM) electrolyser catalysts by electrocatalytic and microscopic measurements" submitted by Dr S Gouws of Nelson Mandela Metropolitan University
- Teaching Time-Table co-ordinator at the department of chemistry
- Member for the Women in Chemistry (WIC) group

Awards

1995-2000: DAAD Scholarship for MSc.

2005-2007: National research Foundation (NRF) of South Africa research Scholarship for PhD

2010/2011: NCST Grant Awards for the research Proposal, " Synthesis of Novel Nanostructured biosensors using Polyaniline and Derivatized-Polyaniline for Analysis and Characterization of Bisphenol A" Dr D Mbui and Dr I Michira

2011/2012: NCST Grant Award for the research proposal, " Fabrication of Silver based Nanobiosensor chips for anti-tuberculosis drugs monitoring for a joint research grant under the kenyan –south african research partnership", Dr I Michira, Prof I Iwuoha

Publications

James K Mbugua, Antipas Kemboi, **Immaculate Michira**, Vincent Madadi, Mark Zaranyika and Geoffrey Kamau, (2012), Adsorption of Atrazine Pesticide by sediments and soil samples: Apparent thermodynamic properties, in Press

Moses Oyagi, **Immaculate Michira**, Peterson Guto, Geoffrey Kamau and Emmanuel Iwuoha, (2012), Synthesis and characterization of silver nanoparticles using tea extracts and their application in nanobiosensors, In press

James K Mbugua, **Immaculate N. Michira**, Stanley M. Kagwanja, Vincent O. Madadi, Mark F. Zaranyika and Geoffrey N. Kamau, (2012), Adsorption of 2,4,5,6-tetrachloroisophthalonitrile (Chlorothalonil) by Nairobi River Sediments: Adsorption Characteristics and related thermodynamic data, **International Journal of Biochemiphysics**, 20: 25-37

Immaculate Michira, Richard Akinyeye, PGL Baker and Emmanuel Iwuoha, (2011) 'Synthesis, characterization and Application of Sulfonated polyaniline in Construction of a biosensor for Diazinon, **Internal Journal of Polymeric Materials**, 60: 469-489

Immaculate N. Michira, 'Synthesis, Electrodynamics and Biosensor Applications of Novel Sulphonated Polyaniline Nanocomposites', (2007)-**Thesis**

Michira I. N, Richard Akinyeye, Mantoa Sekota, Amir Al-Ahmed, Priscillar Baker, Emmanuel Iwuoha, Anthracene sulfonic acid-doped polyanilines: Electrodynamics and Application as amperometric peroxide biosensor (2007). In: **Recent Advances in Analytical Electrochemistry**, Transworld Research network, T.C. 37/661(2), Fort P.O., Trivandrum-695 023, kerala, India, pp 137-166.

I. Michira, R. Akinyeye, V. Somerset, M. J. Klink, A. Al- Ahmed, P.G.L. Baker, E. Iwuoha. Synthesis, characterisation of novel polyaniline nanomaterials and applications in amperometric biosensors, **Macromolecular Symposia**, 2007, 255, 57-69.

Richard Odunayo Akinyeye, **Immaculate Michira**, Mantoa Sekota, Amir Al-Ahmed, Duarte Tito, Priscilla Gloria Lorraine Baker, Christopher Michael Ashton Brett, Maher Kalaji, Emmanuel Iwuoha (2007). Electrochemical Synthesis and Characterization of 1,2-Naphthaquinone-4-Sulfonic acid Doped Polypyrrole. **Electroanalysis**, 19, No.2-3, 303-309.

Richard Akinyeye, **Immaculate Michira**, Mantoa Sekota, Amir Al-Ahmed, Priscilla Baker, Emmanuel Iwuoha (2006). Electrochemical Interrogation and Sensor Applications of Nanostructured Polypyrrolles. **Electroanalysis**, 18(24):2441-2450.

V. Somerset, M. Klink, R. Akinyeye, **I. Michira**, M. Sekota, A. Al-Ahmed, P. Baker, E. Iwuoha. Spectroelectrochemical reactivities of novel polyaniline nanotube pesticide biosensors, **Macromolecular Symposia**, 2007, 255, 36-49.

Richard Akinyeye, **Immaculate Michira**, Shanielle Botha, Priscilla Baker and Emmanuel Iwuoha, Electrocatalytic Sensor Applications of Nanostructured Polypyrrolles and Polythiophenes, 2007, In: **Recent Advances in Analytical Electrochemistry**, Transworld Research network, T.C. 37/661(2), Fort P.O., Trivandrum-695 023, kerala, India, pp 12-137

Immaculate N. Kamau, 'Trace Gas Emissions for Biomass Cookstoves in Kiambu and Bungoma Districts. (A Pilot Study), **2000**. A **Thesis** Submitted for the Partial Fulfillment of the Degree of Master of Science at the University Of Nairobi, Kenya.

Conferences & Workshops:

2012, 9-13th July: The international training Workshop on Grants Management and research Administration, Nairobi, Kenya

2009: Synthesis and Biosensor Applications applications of polyaniline nanocomposites.' A presentation made at chemistry Department- UON.

Michira I. N., Klink M. J, Akinyeye R, Sekota M., Baker P., IwuohE. 'Polyanilino Matrices for Horse Radish Peroxidase(HRP)encapsulation in a Peroxide Sensing Scheme', Paper presented at the 38th Convention of the South African Chemical Institute (SACI), 3-8 December 2006, University of KwaZulu-Natal, Howard College Campus. Reference: Book of Abstracts: The 38th Convention of the South African Chemical Institute, 3-8 December 2006 (poster Presentation).

Michira I. N., Klink M. J, Akinyeye R.O, Somerset V. Mantoa sekota, P. Baker, Iwuoha E. I., 'Use of Polyaniline nanomaterials in the Fabrication of amperometric biosensors', Paper presented in the 9th Annual UNESCO/IUPAC Conference on Macromolecules: Polymers for Advanced Applications Stellenbosch, South Africa: 20/23 November 2006 sensors. [Oral presentation].References: Book of Abstracts: Paper presented in the 9th Annual UNESCO/IUPAC Conference on Macromolecules:Polymers for Advanced Applications Stellenbosch, South Africa: 20/23 November 2006 sensors.

Michira I. N., Somerset V, Klink M, Akinyeye Richard, Sekota Mantoa, Al-Ahmed Amir, Baker P, Iwuoha E*., 'Electrochemical Polyaniline Biosensor for Diazinon Detection', Paper presented to the International Conference on Pesticide use in Developing Countries: Environmental Fate, Effects and Public Health Implications [Oral presentation].Reference: Book of Abstracts, A conference Organised by ANCAP in collaboration with SETAC AFRICA BRANCH, 16-20th Oct. 2006 at the Arusha International Conference, Tanzania.

2007

Emmanuel Iwuoha*, Priscilla Baker, **Immaculate Michira**, Richard Akinyeye, Mantoa Sekota, Amir Al-Ahmed Sensor Research Laboratory, Dept of Chemistry, University of the Western Cape, Cape Town 'Electrochemical Interrogation of Cytochrome p450 (2D6) Nanobiosensors'.

Emmanuel Iwuoha*, Nicolette Hendrikcs, **Immaculate Michira**, Rachel Ngece, Richard Akinyeye, Amir Al-Ahmed, Annalgnaszak, Tesfaye Waryo, Priscilla Baker. 'Nanobiosensor for Amperometric Capture of the Metabolic Profile of Antiretroviral Drugs', [Oral presentation at the 5th Spring Meeting of the international Society of Electrochemistry. Dublin, Ireland.

2005

Michira I. N., Klink M.J., Somerset V., Baker P., Sekota M. and Iwuoha E. I. *, 'Spectroscopic and Electrochemical Properties of Novel Polyaniline Nanotubes'. Paper presented at the East and Southern Africa Environmental Chemistry Workshop (ESAECW) and the Sixth Theoretical Chemistry Workshop in Africa (TCWA); University of Namibia, 5 - 9 December 2005, Windhoek, Namibia. [Oral presentation].

Reference: University of Namibia, The East and Southern Africa Environmental Chemistry workshop and the sixth Theoretical Chemistry Workshop in Africa.

Referees

Prof. E.I. Iwuoha (FRSC, CChem) University of the Western Cape, Department of Chemistry, P.O. Private Bag, X17, 7535, Bellville, CapeTown, South Africa. E-mail address: **eiwuoha@uwc.ac.za**; Tel. Phone: **+27 21 959 3054**

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