

**Career Objectives:**

Lecturer/Researcher/Consultant/Coordinator at Kenyatta University with research interests on new types of nanostructured inorganic and carbonaceous porous solids for gas adsorption (for environmental remediation) and water purification. Currently, I am working on efficacy of microencapsulated active ingredients for downstream tsetse fly repellency. Also with a view of integration of Nanoscience and Nanotechnology in Kenya's educational curriculum coupled with fostering Industrial partnership for potential scale up. I have over a decade of professional teaching experience in secondary schools, possessing solid experience in school management and administration as a Head of Department for Science. My teaching/training areas at University level include modules in Physical Chemistry and Nanoscience/Nanotechnology (spearheading curriculum development). In addition, having completed a course in Supporting Technology Enhanced Learning (STEL), that equipped me with relevant skills for supporting capacity development of e-moderators in higher institutions of learning; and currently supporting Developing People and Enhancing Practice (DPEP) as a tutor under Strategic Partnerships for Higher Education (SPHEIR) I have a passion and commitment to lead in technology enhanced teaching and learning.

I am currently a member of the KU Digital School training team that has trained over 1000 academic staff members on blended learning with focus on the development of interactive modules coupled with online facilitation. In addition, as coordinator for CEP, I plan and deliver materials eg calendar of activities, capacity training schedules and drop-in sessions that support academic and non-teaching staff for quality teaching and learning via Blended Learning mode of delivery.

**Academic and Professional Qualifications:**

**2008-2012 PhD Chemistry;** Fabrication of nanostructured porous inorganic and carbon materials for catalysis and gas storage applications at The University of Nottingham; Supervisor: **Prof. Robert. Mokaya FRSC.**

During a multidisciplinary project I studied a novel class of porous nanostructured materials with tunable porosity for catalysis and gas storage applications. In particular, inorganic and carbonaceous materials at nanometre ( $10^{-9}$ ) scale were prepared, fully characterized using a set of complementary analytical techniques.

**2007-2008 MSc. Nanoscience (Merit):** from the University of Nottingham. Nanoscience is a highly Interdisciplinary course which combines modules and experiments from the schools of chemistry, physics, pharmacy and engineering. MSc Project supervised by **Sir Prof. M. Poliakoff CBE, FRS.**

**1998-1999 Post Graduate Diploma in Education (Credit);** Moi University; Supervisor:- Project work supervised by **Dr. J. Agak**

**1990-1995 Bachelor of Science, (Chemistry major) – 2:1;** Jomo Kenyatta University of Agriculture & Technology.

## Publications:

- S. N. Nyamu, L. Ombaka, **E Masika** and M. Ng'ang'a (2019), One- pot microwave- assisted synthesis of size- dependent l- glutathione- capped spherical silver nanoparticles suitable for materials with antibacterial properties, *Interdisciplinary Nanomedicine* Volume 4 Issue 3 86-94.
- Nicholas Musila, Mathew Munji, Justus Simiyu, **Eric Masika**, Raphael Nyenge and Miriam Kineene, Characteristics of TiO<sub>2</sub> Compact Layer prepared for DSSC application *Traektoriâ Nauki = Path of Science*. 2018. Vol. **4**, No 10
- Ernest O. Nachaki,, Peter M. Ndagili, Noah M. Naumi and **Eric Masika**, Nickel-Palladium-Based Electrochemical Sensor for Quantitative Detection of Formaldehyde; *Chemistry Select* Vol. 3,(2) pp 384–392, 2018
- Nicholas Musila, Mathew Munji, Justus Simiyu, **Eric Masika** and Raphael Nyenge, Effect of TiO<sub>2</sub> Compact Layer on DSSC Performance, *Traektoriâ Nauki = Path of Science*. 2018. Vol. **4**, No 9
- Joseph Odundo, Naumih Noah, Dickson Andala, Janet Kiragu and **Eric Masika**, Development of an electrochemical nano-biosensor for rapid and sensitive diagnosis of bilharzia in Kenya, *South African Journal of Chemistry*, Vol **71**, 2018, 127 -134
- Nicholas Musila, Mathew Munji, Justus Simiyu, **Eric Masika** and Raphael Nyenge, Optical Properties and Analysis of OJL Model's Electronic inter-band Transition Parameters of TiO<sub>2</sub> Films, *Traektoriâ Nauki = Path of Science*. 2018. Vol. **4**, No 7
- Nyamu Samuel, Lucy Ombaka, **Eric Masika**, and Margaret Ng'ang'a, Antimicrobial Photodynamic Activity of Phthalocyanine Derivatives; *Hindawi :Advances in Chemistry Accepted 15 Jan, 2018*
- Ojiambo, O. C, Nawiri, M. P. and **Masika, E.**, Reduction of Cyanide Levels in Sweet cassava Leaves Grown in Busia County, Kenya Based on Different Processing Methods, *Food Research 1* (3) : pp - pp (June 2017).
- M. Ndikau, N. Noah, D. M. Andala and **E. Masika**, Green Synthesis and Characterization of Silver Nanoparticles Using Citrullus lanatus Fruit Rind Extract, *Hindawi: International Journal of Analytical Chemistry*, Volume 2017.
- **E. Masika** and R. Mokaya, Exceptional gravimetric and volumetric hydrogen storage for densified zeolite templated carbons with high mechanical stability', *Energy Environ. Sci.*, 2014, 7, 427 – 434.
- **E. Masika** and R. Mokaya, High surface area metal salt templated carbon aerogels via a simple subcritical drying route: Preparation and CO<sub>2</sub> uptake properties, *RSC Advances*, 2013, 3, 17677 - 17681.
- **E. Masika**, R. Bourne, T. Chamberlain and R. Mokaya, "Supercritical CO<sub>2</sub> mediated incorporation of Pd onto templated carbons: A route to optimising the Pd particle size and hydrogen uptake density", *ACS Applied Materials & Interfaces*, 2013, 5 (12), pp 5639 - 5647.
- **E. Masika** and R. Mokaya, "Preparation of ultrahigh surface area porous carbons templated using zeolite 13X for enhanced hydrogen storage ", *Progress in Natural Science: Materials International*, 2013, 23(3), pp 308 - 316.
- **E. Masika** and R. Mokaya, "Hydrogen storage in high surface area carbons with identical surface area but different pore size: Direct demonstration of the effects of pore size", *Journal of Physical Chemistry C*, 2012, 116 (49), pp 25734 – 25740.
- **E. Masika** and R. Mokaya, 'Mesoporous Aluminosilicates from a Zeolite BEA Recipe', *Chemistry of Materials*, 2011, 23(9), pp 2491 - 2498.

## Selected Conferences and Graduate

### Graduate/Professional Courses:

- The Study Tour on Start-Up Development: the joint project “Collaboration for Entrepreneurial Universities-CEPU” conducted by the Bonn-Rhein-Sieg University of Applied Sciences, the University of Leipzig, Wismar University of Applied Sciences and Leuphana University as well as Kenyatta University and Mount Kenya University Leipzig Germany; between 23<sup>rd</sup> to 29<sup>th</sup> June 2019
- Partnerships in Enhanced Blended Learning (PEBL) Training on Interactive Content Development, Online Facilitation and Staff Capacity Development by Staff Education Development Association (SEDA) of UK: Feb. 2018 to date
- Good Laboratory Practice training workshop: November, 11<sup>th</sup>, 2017.
- Intensive Learning and Teaching Programme (ILTP) Course in Higher Education Learning and Teaching with main focus on enhancement of skills for teachers and supporters of student learning; Venue:- The University of Nottingham; Dates:- 17<sup>th</sup> -22<sup>nd</sup> June 2011.
- Advanced presentation skills, skills for demonstrating in chemistry laboratories, marking and assessment for scientists and a practical look at core teaching skills.

### Conferences and Workshops:

- **Eric Masika**, United Nations Environmental Assembly 3 (UNEA3) with participations in UN Science-Policy-Business Forum on the Environment, taking place at UN Environment’s headquarters in Nairobi 27<sup>th</sup> November – 6<sup>th</sup> December 2017. (Participation)
- Michael Ndikau, Naumih M. Noah, Dickson M. Andala, **Eric Masika** 9<sup>th</sup> Kenya Chemical Society (KCS) International Conference- USIU-Africa, Nairobi, Kenya 9<sup>th</sup>-12<sup>th</sup> May, 2017: Investigation of the Anti-Bacterial activity of Silver Nanoparticles synthesized Using *Citrullus lanatus* fruit rind extract. (Poster)
- **Eric Masika**, 5<sup>th</sup> IUPAC International Conference on Green Chemistry, Durban; South Africa, 17<sup>th</sup> – 21<sup>st</sup> August 2014: Porosity Modulation of Mesoporous Aluminosilicates via Simple Washing/Refluxing in Water for Applications in Water Purification (Talk).
- **Eric Masika**: RSC-P& G SYMPOSIUM ON: Regulatory Harmonization, Hygiene and Sustainability July 8<sup>th</sup> and 9<sup>th</sup> 2014 Chiromo Campus University of Nairobi: Provision of sustainable water for domestic application. (Talk)
- **Eric Masika**, Kenya Chemical Society, Nairobi Chapter AGM cum workshop, Kenyatta University on 15<sup>th</sup> February 2014 (Attendance).
- **Eric Masika**: 1<sup>st</sup> Stakeholder’s workshop to discuss the draft Policy on exploitation of Nanotechnology at Utalii hotel, Nairobi, Kenya on 16<sup>th</sup> January, 2014. (Attendance).
- **Eric Masika** and Robert Mokaya, ‘TA Instruments - UK Materials Characterization seminar, University of Bradford, 13<sup>th</sup> and 14<sup>th</sup> September 2011 ‘Synthesis and Characterization of Pd-doped Zeolite Templated Carbons for Hydrogen Storage.’(Poster).
- **Eric Masika**, Richard Bourne, Thomas Chamberlain and Robert Mokaya, 34<sup>th</sup> Annual British Zeolite Association Conference, Edinburgh, 11 -13<sup>th</sup> April 2011, ‘Supercritical CO<sub>2</sub> mediated Incorporation of Palladium Nanoparticles into Zeolite Templated Carbons with enhanced Hydrogen Storage; (Presentation).
- **Eric Masika** and Robert Mokaya, 34<sup>th</sup> Annual British Zeolite Association Conference, Edinburgh, 11 - 13<sup>th</sup> April 2011. ‘Mesoporous Aluminosilicates via Molecular Templating; (Poster).
- **Eric Masika** and Robert Mokaya, Driving innovation in Chemistry and Engineering Lectures, The University of Nottingham, 12<sup>th</sup> March 2010, ‘Templating Routes to Nanostructured and Mesostructured Porous Materials;.(Presentation).
- **Eric Masika** and Robert Mokaya, 2010 Physical Chemistry Postgraduate Symposium, 9<sup>th</sup> July 2010. ‘Synthesis and Characterization of Pd-doped Zeolite Templated Carbons for Hydrogen Storage; (Presentation).
- **Eric Masika** and Martyn Poliakoff, MSc. Nanoscience (2007/2008 ) Research day, The University of Nottingham, 21<sup>st</sup> August 2008; ‘The Supercritical Hydrothermal Synthesis of Metal Oxide Nanoparticles; (Presentation).

### Fields of Expertise:

- Hydrothermal synthesis and Surface modification
- Supercritical fluids Synthesis
- Powder X-rays diffraction
- Thermal analysis
- Infrared Spectroscopy

- Chemical Vapor Deposition (CVD)
- Gas storage
- Electron Microscopy (SEM and TEM)

### **Current Employment and Teaching Experience:**

#### **Lecturer/Researcher**

#### **Kenyatta University, December 2013 - To Date**

Currently teaching Physical Chemistry Modules in the Department of Chemistry: - Applied Electrochemistry, Chemical Thermodynamics and Introduction to Physical Chemistry I. I am also, involved in the supervision of Postgraduate students. My goal is to spearhead the development and integration of Nanoscience and Nanotechnology in the University curriculum at undergraduate level by next academic year. In addition, being a committee member for the departmental consultancy unit, we partner up with Pest Control Products Board to carry out physicochemical and chemical analysis.

### **Research Student Supervision:**

- **Bernadatte Moraa Ratemo (B. Sc. Analytical Chem. with Management); I56/37034/2016**  
**Topic:** Microencapsulation of an optimized 4-component tsetse- repellent blend into  $\beta$ -cyclodextrin and the kinetics of release
- **Nyamu N. Samuel (MSC. Chemistry); I84/32254/2015**  
**Topic:** Synthesis, spectrophotometric and photocatalytic activity of novel phthalocyanine conjugated to metal nanoparticles and study of their antimicrobial properties
- **Okumu M. Assumptor (B.Ed Sci); I56/29971/2014**  
**Topic:** Probing the optimal blends of pozzolans to develop supplementary cementing material within Busia County, Kenya
- **Ernest Ojiambo Nachaki (Bed. SC) I56/CE/25228/2013**  
**Topic:** Fabrication of nickel-palladium based electrochemical sensor for quantitative detection of formaldehyde in water
- **Michael Ndunda Ndikau B.Ed. (Sc.): I56/20027/2012**  
**Topic:** Green synthesis of silver nanoparticles using citrullus lanatus rind extract as reductant for anti-bacterial applications against selected bacteria
- **Musila Nicholas Muendo (M. Sc): REG. NO. I84/32067/2015**  
**Topic:** Characterization and efficiency improvement studies of TiO<sub>2</sub> based dye-sensitized solar cells
- **Pauline Nanjala Juma (B.Sc.) I56/27266/2014**  
**Topic:** Citric acid modified sugarcane bagasse for Cu (II), Cd (II), Pb (II) and Cr (VI) ions removal in wastewater
- **Okello James Olando, B.Ed (Sci) – KU: I56/23324/2013**  
**Topic:** High capacity Li-ION battery anodes using nanostructured silicon from wheat husks
- **Sigei Kipkirui Enock B.Ed (Sci) – REG No. I56/22808/2012**
  - **Topic:** Low cost nanostructured silicon for high performance Li-ion battery anodes from rice husks (RH)
- **Markus Okoth Odhiambo (BE.D SC.) REG No I56/CE/21449/2012**
  - **Topic:** Thermo-chemical characteristics of peat as a potential Gasfier fuel in the Lake Victoria basin
- **Charles Ojiambo Ogombe (BED Sci): REG NO: I56/23844/2012**
  - **Topic:** Determination of cyanide levels and effective methods of processing cassava leaves used as vegetables in coast and western regions, Kenya
- **Nafuna Elizabeth Wanyonyi (B.E.D SC) REG NO. I56/CE/24489/2012**
  - **Topic:** characterisation of TiO<sub>2</sub> based dye-sensitized solar cell prepared by screen printing method

### **Internal Examiner for Postgraduate Theses:**

- M/TH/188/2019; Computational chemistry studies of structural, electronic properties and energies of pyrazinamide and its analogues for prediction of druglikeness. (MSc.)

- PHD/023/2019; Remediation of fluoride in aquatic media using modified polyethylene. **(PhD)**
- Omog Linus Owino; I56/CE/26146/2011; determination of mineral nutrients levels and growth rate in vegetables grown using organic water hyacinth compost and inorganic fertilizer. **(MSc.)**
- Joseph Mwit Marangu: I84/32253/2015; Effects of potential activators on performance of calcined clay-based cement. **(PhD)**
- Omutoko Nyangasi Leah; I84/25950/2013; Synthesis, characterization and evaluation of Pd-nanoparticles supported on Titania nanofibers as a catalyst for heck reactions. **(PhD)**
- Omolloh George Ochieng; I56/27766/2014; moving domain quantum mechanics/molecular mechanics methods for interactions of human estrogen receptor alpha with endocrine disrupters. **(MSc.)**
- Titus Munyao Kasimu; I56/21187/2012; Using pyro-processed products of coconut waste for removing colour, turbidity and selected metal ions from contaminated water. **(MSc.)**
- Shisia Kuboka Silvanus; I84/11265/2006; fabrication and characterization of magneto responsive carbon nanotube-infused polysulfone (cnt-ipsf) nanocomposite for water purification. **(PhD)**
- Murithi Genson Leonard; I84/21440/2010; Investigation of industrial wastewater treatment using potential organic and inorganic adsorbents. **(PhD)**
- Chepngetich Josephine; I56/CE/22616/201; Capacities and efficiencies of electrospun titania nanofibres in removing organic dyes and pesticides from contaminated water. **(MSc.)**
- Adamu Abdulhameed; I56F/CE/27069/2013 Synthesis of silicon nitride from rice husk and sugarcane bagasse ashes for adsorption of fluoride ions from waste water. **(MSc)**
- Nthiga Esther Wanja: I84/21982/2012; Efficacy and kinetics of adsorption of selected heavy metal cations by fruit waste products in natural and modified form. **(PhD)**
- Maingi Mukora Francis; I56/11157/2006; Aluminophosphates derived from tea leaves and pumpkin seeds for removal of selected heavy metals from contaminated water. **(MSc.)**
- Mbugua Wachira Gerald: REG No. I56/CE/22769/2010; “Zeolitic materials from rice husk and water hyacinth for removal of Lead, Cadmium, Methylene blue and suspended particles from water.” **(MSc)**
- Enos Wamalwa Wambu: REG. No.: I84/12777/2009; Removal of fluoride from water by adsorption using natural geomaterials from Kenya –a comparative study. **(PhD)**
- Wasike Peter Wekesa - REG No. I56/CE/12013/2007; Analysis of Selected Heavy Metals in Water from River Kuywa Adjacent Wells In Bungoma Central Sub-County, Kenya. **(MSc.)**
- Githinji Irene Mueni: REG. No. I56/22603/2012; Synthesis of Alumino-phosphate from Bones for Water Remediation. **(MSc.)**
- Kirkok Samuel Kipyegon, REG. No. I56/CE/22221/2010; Characterization of Honey Produced by *Apis mellifera* and *Melipona* Bees in Marigat and East Pokot Regions of Baringo County – Kenya. **(MSc.)**

#### **Administrative Responsibilities:**

- Ag. Director, Centre for Teacher Professional Development and Excellence; 4<sup>th</sup> March 2019- 5<sup>th</sup> May 2019
- Ag. Director, International Programmes and Collaborations; 3<sup>rd</sup> -19<sup>th</sup> Dec, 2018.
- Ag. Dean, Digital School; 16<sup>th</sup> – 23<sup>rd</sup> April 2018
- Coordinator, Institutional Based Programmes (IBP), Digital School; 12th Jan, 2018 to Date
- In charge of Departmental Website: Chemistry Department since August 2016 to Date
- Committee Member Department of Chemistry Consultancy Unit (KU-DCCU); accredited by Pest Control Products Board (PCPB): Since April 2016 – to date.
- Department curriculum review committee member: Sept. 2016 to date
- Zonal Coordinator: Teaching Practice and Mentorship since March 2016 to Feb 2018
- STEP Trainer: Since March 2015 – to - Date
- Assistant Examination Coordinator: Chemistry Department; Since Oct 2015- to- Date

- Digital School Coordinator for School of Pure and Applied Sciences since July 2014 to June 2017
- Teaching Practice Supervisor since May 2014 to Date
- Team Leader – Departmental Secretariat since May 2014 to Date
- Committee Member – Departmental MSc Industrial Chemistry review committee since May 2014 to Date
- Mentor ; Kenyatta University Mentorship Programme since March 2014 to Date

### **Previous Employment Experience:**

#### **Postdoctoral Research Associate**

#### **The University of Nottingham, November 2012 – November 2013**

Developing protocols for optimized porosity modulation in nanostructured porous materials for multi-spectral magnetic resonance imaging (MRI) contrast agents, gas storage and catalysis applications. Administrative duties include group website management, ensuring that equipment's are safe and serviceable. Finally, teaching duties include contribution to the induction, supervision and support of PhD, MSc and fourth year project students.

**2009 To 2013:- Students' mentor;** where I was responsible teaching literature and scientific communication skills to small groups of students.

**2008 To 2012:- Undergraduate Laboratory Demonstrator;** where I supervised first year students in laboratory skills, giving pre-lab talks, marking scripts and providing feed-back to students on their work.

**2008 To 2013:- Student Ambassador;** where I worked independently and/or teams by leading groups of prospective students on campus tours during open days, UCAS and onsite visits. I also, would regularly be asked to help train new ambassadors when they are recruited.

**1997 To 2007:- Graduate Teacher 1;** my duties and responsibilities as Head of department (science) included coordination of science curriculum implementation. I also prepared annual budget proposals for science department. My teaching subjects were chemistry and mathematics. In addition, I was contracted by Kenya National Examination Council (KNEC) as a national examiner in chemistry paper 2.

**1995 To 1997:- Pharmacy Assistant;** where my duties and responsibilities involved dispensing medication as well as liaising with pharmaceutical companies on new lines of medicines.

### **Awards/ Achievements:**

- Postdoctoral Pump-priming project under EPSRC to investigate the physical concept underlying the hollow spheres contrast agents in Magnetic Resonance Imaging (MRI).
- Vice-Chancellor's Achievement Award for exemplary Student Ambassador.
- Extended Engineering and Physical Science Research Council (EPSRC) Award.
- School Marched Scholarship for PhD in Chemistry
- All Saints Educational Trust (ASET) for MSc Nanoscience.
- Burnside Rutherglen Church Bursary for BSc

### **Volunteering:**

**STEM Ambassador;** Motivational talks encouraging students into pursuing courses in Science, Technology, Engineering and Mathematics (STEM).

**Number Partners Volunteering Community Ambassador:** Aimed at inspiring children from “under represented” student groups to develop their understanding and love of math's by taking a new and innovative approach to learning.

### **Membership of scientific societies:**

- Committee Member – PACN/RSC Local Management Committee- since Jan 2017
- Member: Kenya Chemical Society since Jan 2014.
- Member:- British Zeolite Association since April 2011
- Committee Member:-The Royal Society of Chemistry East Midlands Section Trust; from November 2008 to March 2013.
- Associate Member:- Royal Society of Chemistry since September 2008
- Member:- Midlands Physics Alliance Graduate School since January 2008

**Referees:**

**Prof. Robert Mokaya FRSC**  
Professor of Materials Chemistry  
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