

MBUGUA JAMES KAMAU

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Career Objective

Young and innovative Green chemistry researcher committed to offering the best education and research platform to students to solve persistent problems facing the current world.

Education and Credentials

Doctor of Philosophy in Chemistry 2021

UNIVERSITY OF NAIROBI: Research Thesis: *'Optimization and Design of an Effective Anaerobic Digester for Biogas Production Using Vegetable Wastes from Kenyan Markets'*

Masters of Science in Chemistry 2015

UNIVERSITY OF NAIROBI: Studied pure chemistry majoring in organic, inorganic, physical, electrochemistry and industrial chemistry

Bachelor of Science Chemistry 2006

UNIVERSITY OF NAIROBI: Studied pure chemistry majoring in organic, inorganic, physical, electrochemistry and industrial chemistry and graduated with second class honors-upper division.

Kenya Certificate Secondary Education 2001

KANUNGA HIGH SCHOOL: Attained grade B plus

Kenya Certificate Primary Education 1992

GATUURA PRIMARY SCHOOL: Attained 456 marks

Professional Training

ENVIRONMENTAL IMPACTS ASSESSMENT & ENVIRONMENTAL AUDIT

- African Nazarene University
- A certified Environmental Impact Assessment and Environmental Audit

LEAN SIX SIGMA YELLOW BELT CERTIFICATION AND TRAINING

- Innovative Consultants for End to End Quality Business Solution(iceqbs)

Professional Experience

LABORATORY ANALYSIS SKILLS

- Worked in various laboratory in quality control e.g. water analysis, pesticides samples preparations, food analysis.
- Very accurate, precise and consistent in weighing, standards preparations and instruments usage.

Skills Summary

HIGH PRESSURE LIQUID CHROMATOGRAPHY SKILLS: Several years' experience in analyzing samples using HPLC particularly on food stuff and pesticides standards.

UV-VISIBLE SKILLS: Several years' experience in analyzing samples using UV-VIS particularly on food stuff and pesticides standards.

ATOMIC ABSORPTION SPECTROPHOTOMETER: Several years' experience in analyzing samples using AAS particularly on food stuff and pesticides standards.

Research Experience

PART-TIME LECTURER 2017 to Present
TECHNICAL UNIVERSITY OF KENYA

Preparation of coursework materials, teaching of students, preparation of exams and evaluation of students

RESEARCH ASSISTANT 2009 to Present
UNIVERSITY OF NAIROBI

Supervised seven students on their undergraduate research project, the students achieved commendable results in analytical work on pesticides and soil study.

WASTE WATER TREATMENT 2012 to 2016

DANDORA WASTEWATER TREATMENT PLANT

In collaboration with Howard University, worked on effective wastewater treatment projects aimed at Biogas production and heavy metals reduction before discharge to Nairobi River.

QUALITY CONTROL

2011 to 2011

MAC'S PHARMACEUTICALS LIMITED

Water and drugs analysis using various instruments including HPLC. This ensured quality drugs are offered to the market which is not only efficient but also very effective. This gave the company a competitive advantage over others hence boosting sales and the company's legacy.

DATA ANALYST

2010 to 2011

RESEARCH SURVEYOR

Collected education data from both parents and pupil/students and lead the analysis process of the collected data. With the introduction of free primary education, the quality of education had deteriorated. This survey proposed ways in which education in semiarid areas could be improved based on the findings. It has been reported that education has improved with most students now being able to read and write characterized by gradual good performance from the studied area.

Activities and Honors

- **CERTIFICATE - A.M.K.A.** Kiambu District, 2006. Leader of a youth program aimed at awakening men for knowledge and action.
- **CERTIFICATE IN COMPUTERISED ACCOUNTING** - Emanex Computer College. NAIROBI, 2009 to 2009. Awarded a certificate in computerized accounting in sage l50, quick books and sage
- **CERTIFICATE IN COMPUTER - KSMDS.** NAIROBI, 2005 Competent in computer usage in windows and Linux in addition to basic computer skills, I have advanced knowledge in web development using dream-weaver, CSS, fireworks and html. I have adequate knowledge in the following programming languages; R programming, Arduino, visual basics, Perl, python.

Professional Membership

- **Royal society of chemistry:** 2018 -Current.
- **African Network for Chemical Analysis of Pesticide and Other Pollutants:** Board Member
- **ESSAEC- TCCA:** 2018 –Current

Articles Published

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1. **Mbugua J. K¹**, Mbui D. N¹, Mwaniki J. M¹, Mwaura F. B (2021), A Micro-Controller Based Biogas Leakage and Fire Detection System, *International Journal of Scientific Research in Science, Engineering and Technology*, **8**(2), 216-221
2. **Mbugua J. K.**, Mbui D. N, Mwaniki J. M, Mwaura F. B (2020), "Biochemical Methane Potential (BMP) of Market Wastes from Nairobi Inoculated with Dagoretti Slaughterhouse Waste", *International Journal of Scientific Research in Science, Engineering and Technology (IJSRSET)* **7**(4), pp. 81-90.
3. **Kamau J. M.**, Mbui D. N, Mwaniki J. M, Mwaura F. B (2020) Lab Scale Biogas Production from Market Wastes and Dagoretti Slaughterhouse Waste in Kenya, *International Journal of Energy and Environmental Research*, **8**(1), pp.12-21
4. **Kamau J. M.**, Mbui D. N, Mwaniki J. M, Mwaura F. B (2020) Influence of Substrate Proximate Properties On Voltage Production in Microbial Fuel Cells, *International Journal of Energy and Environmental Research* **8**(1), pp.12-21
5. **Kamau, J. M.**, Mbui, D. N., Mwaniki J. M., & Mwaura, F. B. (2020). Proximate analysis of fruits and vegetables wastes from Nairobi County, Kenya. *Research Journal of Food Science and Nutrition*, **5**(1),
6. **Kamau J.M.**, Mbui D.N, Mwaniki J.M, Mwaura F.B (2019), Application of microbial fuel cells in the degradation of 2,4,5,6-tetrachloroisophthalonitrile (chlorothalonil), *Journal of Bioscience and Biotechnology Discovery*, **4**(2), pp 28-35.
7. **J.K. Mbugua**, D.N. Mbui, J.M. Mwaniki, F.B.Mwaura(2018), Electricity Generation by *Clostridium spp* and *Proteus vulgaris* from Rotten Tomatoes in a Double Chamber Microbial Fuel Cell, *International Journal of Research Studies in Microbiology and Biotechnology(IJRSMB)*,**4**(4) PP 32-38
8. **Kamau J.M.**, Mbui DN, Mwaniki JM, Mwaura FB (2018) Utilization of rumen fluid in production of bio– energy from market waste using microbial fuel cells technology *J Appl Biotechnol Bioeng.* 2018; **5** (4):227–231.
9. **Kamau J.M** Mbui DN, Mwaniki JM, Mwaura FB (2018), Characterization of voltage from food market waste: microbial fuel cells. *Int J Biotech & Bioeng.* **4**:3,

10. Waswa GA, Michira I, Abong O, **Mbugua J.K**, Andala D, et al. (2018) Dissipation and Sorption of Urea on Eburru Soils in Kenya. *J Phys Chem Biophys* 7: 271. doi: 10.4172/2161-0398.1000271
11. A WG, D. A, O. AA, GN K, I.N M, **J.K M**. "Kinetics and Isothermal Studies of Lambda Cyhalothrin Sorption on eburru Soils in Kenya." *Journal of Kenya Chemical Society*. 2017;10(1):24-34.
12. **Kamau J.M**, Mbui D.N, Mwaniki J.M, Mwaura F.B(2017) Cow Dung to Kilo Watt using Double Chamber Microbial Fuel Cell. Online ISSN: 2394-4099 JSRSET | Volume 3 | Issue 5 | Print ISSN: 2395-1990 Themed Engineering and Technology
13. **Kamau J.M**, Mbui DN, Mwaniki JM, Mwaura FB, Kamau GN (2017) Microbial Fuel Cells: Influence of External Resistors on Power, Current and Power Density. *J Thermodyn Catal* 8: 182. doi: 10.4179/2160-7544.1000182
14. **Mbugua J.K**, Mbui D, Kamau GN (2017) Investigation of Rate of Photo Degradation of Chlorothalonil, Lambda Cyhalothrin, Pentachlorophenol and Chlropysis on Tomato and Spinach. *Mod Chem Appl* 5: 200. doi: 10.4172/2329- 6798.1000200
15. **Kamau J**, Kamau G (2017) Modeling of Experimental Adsorption Isotherm Data for Chlorothalonil by Nairobi River Sediment. *Mod Chem Appl* 5: 203. doi: 10.4172/2329-6798.1000203
16. S. S. Sherriff, **J. K. Mbugua**, and G. N. Kamau 3(2017) Comparative Degradation Study of Lambda Cyhalothrin in Soils from Athi River and Kwale Areas in Kenya: *International Journal of Scientific Research in Science, Engineering and Technology, IJSRSET* | Volume 3 | Issue 1 | Print ISSN: 2395-1990 | Online ISSN: 2394-4099
17. Sherrif SS, Madadi V, Mbugua J.K, Kamau GN (2017) **Adsorption of Lambda Cyhalothrin on to Athi River Sediments: Apparent Thermodynamic Properties**. *Mod Chem Appl* 5: 213. doi: 10.4172/2329-6798.1000213
18. Mwaniki JM, Kali AM, **Mbugua J.K**, Kamau GN. "A New Variant of the Hydraulic Stirring Mechanism for Pilot Scale Wet Thermophilic Anaerobic Digester." *Journal of Kenya Chemical Society*. 2016; Vol. 9(1):135-155 135-155.
19. Gabriel A. Waswa^a, **James K. Mbugua^a**, Helen N. Njenga^a, Fredrick Oduor^a, Peter Githira^b and Geoffrey N. Kamau; Isotherm and Kinetic Studies On Adsorption of N-(3,4-Dichlophenyl)-N,

N-Dimethyl Urea by Lake Naivasha Soils: International Journal of BioChemiPhysics, Vol.23, December 2015.

20. Gabriel A. Waswa^a, **James K. Mbugua^a**, Helen N. Njenga^a, Fredrick Oduor^a, Peter Githira^b and Geoffrey N. Kamau^{ab}: Adsorption Of 1-Naphthyl-N-Methyl Carbamate By Selected Soils From Lake Naivasha Region In Kenya: Adsorption Properties And Related Thermodynamic Data: International Journal of BioChemiPhysics, Vol. 23, December 2012.
21. **J.K. Mbugua**, D.N. Mbui, G.N. Kamau: Adsorption of Dursban (Chlorpyrifos) Pesticide by Loam Soil from Limuru, Kenya: Apparent Thermodynamic Properties. *Africa Journal of Physical Sciences Vol.1 No.1 2014*
22. **James K. Mbugua**, Antipas Kemboi, Immaculate N. Michira, Vincent Madadi, Mark F. Zaranyika and Geoffrey N. Kamau: Adsorption of Atrazine Pesticide by Sediment and Soil Samples: Effect of Equilibration Time on the Freundlich Parameter (*N*): International Journal of BioChemiPhysics, Vol. 22, 2014.
23. **James K. Mbugua**, Antipas Kemboi, Immaculate N. Michira, Vincent Madadi, Mark F. Zaranyika and Geoffrey N. Kamau: Adsorption Characteristics of Captafol Pesticide by Sediment and Soil Samples: Apparent Thermodynamic Properties Using Spectroscopic Methods: International Journal of BioChemiPhysics, Vol. 22, 2014.
24. **James K. Mbugua**, Immaculate N. Michira, Vincent Madadi, Mark F. Zaranyika and Geoffrey N. Kamau: Adsorption of 2, 4, 5, 6-Tetrachloroisophthalonitrile (Chlorothalonil) By Nairobi River Sediments: Adsorption Characteristics and Related Thermodynamic Data “International Journal of BioChemiPhysics, Vol. 20, December 2012.
25. Harper, G.W., Riplinger, A.J., **Mbugua, J.D.**, Karegi, B., O’Callahan, E., & Neubauer, L.C. (June 2009). *Participatory program development with young men in Kenya: The story of AMKA*. Paper presented at the Biennial Meeting of the Society for Community Research and Action, Montclair, New Jersey.

Patents

- **KIPI PATENT NO. KE/P/2020/3707**, Biogas Digester Automation
- **KIPI PATENT**, A Micro-Controller Based Biogas Leakage and Fire Detection System

Editorial Team

Date	Journal
2021 – Current	Journal of Sustainable Development
2019 – Current	Asian Journal of Soil Science and Plant Nutrition
2019 – Current	Biological Sciences and Pharmaceutical Research
2016 – Current	International Journal of BioChemiPhysics

Licenses

- **COMPUTER REPAIR AND MAINTENANCE - ICDL**, 2011 to 2030. Have a license in computer repair and maintenance in hardware and software installation.

Training, Skills & Seminars

- **CERTIFICATE OF PARTICIPATION - AMKA**, 2004. Participated in seminars and workshops on HIV and AIDS education, health hazards and critical thinking
- **CERTIFICATE OF PARTICIPATION - YADSTI**, 2010. Participated a seminar on climate change at UNEP and later tree planting session at Mau forest in operation *okoa* MAU forest.
 - **ANCAP 2015 SUMMER SCHOOL**: Participated in African Network of Chemical Analysis of Pesticide in Makerere University Kampala Uganda: Presented A Paper On Adsorption of Pesticide Residues Isotherm Models.

Recognition

- **CERTIFICATE AND T-SHIRT - HOWARD UNIVERSITY NAIROBI**, 2012. Honored for research experience in a research collaboration between university of Nairobi and Howard University
- **CERTIFICATE OF RECOGNITION - GATUURA SECONDARY SCHOOL**, 2012. Certificate of recognition as a starter teacher of a local secondary school being the first science teacher in the school and heading counseling department
- **CHARITY WELFARE ORGANISATION - CERTIFICATE OF RECOGNITION**, 2012. Recognized for efforts in starting the first non-

governmental organization in Ndeiya with the aim of helping the poor and the less fortunate in the area.

• **CERTIFICATE IN PEER EDUCATION** - AMKA, 2004. Awarded scholarship to study peer education and later teach other peers

Volunteer

LIBRARIAN

2010 to 2010

Daughter of Charity, NDEIYA

Participate in volunteer work at Daughters of Charity as assistant librarian for 3 hours a day. My roles include; issuing books, ensuring order in the study room, assisting students in various capacity among others.

TUTOR TEACHER

2011 to Present

A.I.C THIGIO CDC, NDEIYA

Has volunteered in teaching compassion students every Saturday and during the school holidays to ensure good academic performance from children from poverty stricken homesteads.

Conference

Name of Conference	Year	Venue	Presented a Papers?
THE 13 TH AFRICAN NETWORK OF CHEMICAL ANALYSIS OF PESTICIDE AND OTHER POLLUTANTS	2020	University of Dar es Salaam	Abstract
The 12 th ANCAP SYMPOSIUM	2019	University of Dar es Salaam	Presented
IUPAC FOR AFRICA:POSTGRADUATE SUMMER SCHOOL ON GREEN CHEMISTRY	2019	University of Dar es Salaam	Poster
PACN CONGRESS 2018: MANAGING RESOURCES THROUGH CHEMISTRY: WEALTH NOT WASTE	2018	University of Nairobi, Kenya	Flash presentation & poster
EAST AND SOUTHERN AFRICA ENVIRONMENTAL/ANALYTICAL CHEMISTRY & THEORETICAL CHEMISTRY CONFERENCE	2018	MOMBASA, KENYA	YES & Poster
THE 10 TH AFRICAN NETWORK OF CHEMICAL ANALYSIS OF PESTICIDE AND OTHER POLLUTANTS	2017	MOMBASA, KENYA	YES
THE 7 TH INTERNATIONAL SEANAC-AFRICA ANALYTICAL & ENVIRONMENTAL CHEMISTRY CONFERENCE	2017	MOMBASA, KENYA	YES & Poster
9 TH AFRICAN NETWORK OF CHEMICAL ANALYSIS OF	2017	NAIROBI, KENYA	YES

PESTICIDES			
14 TH EAST & SOUTHERN AFRICA LABORATORY MANAGERS ASSOCIATION	2016	KAMPALA, UGANDA	YES
EAST AND SOUTHERN AFRICA ENVIRONMENTAL/ANALYTICAL CHEMISTRY CONFERENCE AND THE 11 TH THEORETICAL CHEMISTRY CONFERENCE IN AFRICA (TCCA)	2016	MOMBASA, KENYA	YES
13 TH EAST & SOUTHERN AFRICA LABORATORY MANAGERS ASSOCIATION	2014	MOMBASA, KENYA	YES
INTERNATIONAL CENTRE FOR CHEMICAL SAFETY AND SECURITY	2015	MOMBASA, KENYA	NO
8 TH SYMPOSIUM OF AFRICAN NETWORK OF CHEMICAL ANALYSIS OF PESTICIDE	2015	KAMPALA, UGANDA	YES
5 TH SOUTHERN & EASTERN AFRICA NETWORK OF ANALYTICAL CHEMISTS	2014	MOMBASA, KENYA	YES

POST-GRADUTE STUDENTS PROJECTS SUPERVISED

Doctor of Philosophy(Consultant)

Ajiliu Kinyua: Anaerobic Decomposition of Lambda Cyhalothrin, Chlorothalonil and Pentachlorophenol Using Microbial Fuel Cells Technology

Gabriel Wasswa: Characterization and Application of Nanozeolitic Materials as Smart Delivery System for Selected Fertilizers and Pesticides

Masters

Kennedy Imwene: Resource Recovery: Use of Microbial Fuel Cells in Electricity Production from Fruit Waste in Nairobi Kenya.

Ajiliu Kinyua: Photo-Degradation of Pentachlorophenol and Dimethoate on the Surface of Loam Soil, Nairobi River Sediment and Spinach from Ngara Market in Kenya - graduated

Salia Sheriff: Degradation and Adsorption of Lambda-Cyhalothrin on Athi River and Coastal Soils and Sediments in Kenya - graduated

James Mungai: Removal of Chlorothalonil and Lambda Cyhalothrin Residues and Their Photo-Degradation Process in Selected Vegetables Sold in Nairobi Markets (Finished)

UNDERGRADUTE STUDENTS PROJECTS SUPERVISED

1. **Orang'o:** Adsorption of atrazine by Nairobi river sediment and soil samples using high pressure liquid chromatography
2. **Antipas Kemboi:** Adsorption of atrazine by river sediments and soil samples using UV-Visible spectrophotometry
3. **Irene Maina:** physical-chemical analysis of soil samples under capillarity, temperatures retention, water retention and adsorption of carbonyl.
4. **Jeffrey Otieno:** Degradation of diquat dibromide under different environmental conditions
5. **Kevin Karanja:** Adsorption of atrazine by Nairobi river sediment and soil samples using UV-Visible spectrophotometry
6. **Moses Mutai:** Phosphorus removal by chemical precipitation and enhanced biological phosphorus removal from wastewater.

REFERENCE

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