


Academic Staff Profile

Personal Profile

Personal Details

<p>Name: Evans Changamu Ogwagwa Title/Qualification: Dr Department: Chemistry Designation/Position: Senior Lecturer Email: changamu.evans@ku.ac.ke Contact Address: Department of Chemistry P.O. Box 43844 Nairobi 00100 Area of Specialization: Inorganic Chemistry -Organometallic Chemistry -Coordination Chemistry Research Interests: -Organometallic Synthesis including derivatization of active pharmaceutical agents -Organometallic computational Chemistry Google Scholar: Citations - 219 h-index - 10 i10 index - 10 ORCID ID: https://orcid.org/0000-0001-6021-8050</p>	
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Academic & Professional Qualifications

Ph.D. University of Kwazulu-Natal, South Africa (2008)

M.Sc. (Chemistry), Kenyatta University (1998)

B.Sc. Chemistry (Hons 2nd Upper Division), Moi University (1993)

Employment History

2018 to date Senior Lecturer, Department of Chemistry, Kenyatta University, Nairobi
2007 to 2018 Lecturer, Department of Chemistry, Kenyatta University, Nairobi, Kenya
1999 – 2007 Tutorial Fellow, Department of Chemistry, Kenyatta University

Achievements

Started the molecular modelling and computation chemistry research Laboratory at the Department of Chemistry in 2012. First PhD student in synthetic and computational chemistry graduated in December 2020. Several MSc students have also graduated since inception of the laboratory. Others are going on with research.

Publications

Referred Journals

1. **Evans O. Changamu**, Holger B. Friedrich, Manuel A. Fernandes, 2009. A structural investigation of the heterobimetallic carbocation complex $[\text{Cp}^*(\text{CO})_2\text{Fe}\{\mu-$

$\text{CH}_2\text{CH}(\text{CH}_2)_3\text{W}(\text{CO})_3\text{Cp}]\text{BPh}_4$ *Inorganica Chimica Acta* 362, 2947–2950. DOI: 10.1016/j.ica.2008.12.026

2. **E.O. Changamu**, H.B. Friedrich, M. Rademeyer, 2008. Synthesis and structure of the monometallic cationic complex $[\text{Cp}(\text{CO})_2\text{Fe}\{\eta^2-(\text{CH}_2\text{CHCH}_2\text{CH}_3)\}]\text{PF}_6$ (Cp = $\eta^5\text{-C}_5\text{H}_5$), *Journal of Organometallic Chemistry* 693 (1), 164-168
3. **E.O. Changamu**, H.B. Friedrich, 2008. Synthesis, characterization and reactions of the transition metal halogenoalkyl carbocation complexes $[\text{Cp}(\text{CO})_2\text{M}\{\eta^2\text{-CH}_2\text{CH}(\text{CH}_2)_n\text{X}\}]\text{PF}_6$ (n = 1–8, 10, M = Fe; n = 3, 4 M = Ru; X), *Journal of Organometallic Chemistry* 693 (21-22), 3351-3356
4. **E.O. Changamu**, HB Friedrich, RA Howie, M Rademeyer, 2007. A structural investigation of the carbocation complex $[\{\text{Cp}^*(\text{CO})_2\text{Fe}\}_2\{\mu\text{-}(\text{C}_3\text{H}_5)\}]\text{PF}_6$ *Journal of Organometallic Chemistry* 692 (22), 5091-5096
5. **Evans O. Changamu**, Holger B. Friedrich, 2007. A study of β -hydride abstraction from alkanediyl homobimetallic complexes $[\{\text{Cp}(\text{CO})_2\text{Fe}\}_2\{\mu\text{-}(\text{C}_n\text{H}_{2n})\}]\text{PF}_6$ (n = 4-10, Cp = $\eta^5\text{-C}_5\text{H}_5$) *Journal of Organometallic Chemistry* Volume 692, Issue 5, 1, 1138-1149, <https://doi.org/10.1016/j.jorganchem.2006.11.017>
6. **Evans O. Changamu**, Holger B. Friedrich, Melanie Rademeyer, 2007. Synthesis and characterization of transition metal stabilized carbocations of the types $[\text{Cp}^*(\text{CO})_2\text{Fe}\{\mu\text{-}(\text{C}_n\text{H}_{2n-1})\}\text{M}(\text{CO})_x\text{Cp}\}]\text{PF}_6$ (x = 2, M = Fe or Ru; x = 3, M = W, Cp* = $\eta^5\text{-C}_5(\text{CH}_3)_5$; Cp = $\eta^5\text{-C}_5\text{H}_5$; n = 3–6) and $[\text{Cp}(\text{CO})_2\text{Ru}\{\mu\text{-}(\text{C}_n\text{H}_{2n-1})\}\text{W}(\text{CO})_3\text{Cp}]\text{PF}_6$ (n = 3–5) and the crystal structures of the complexes $[\text{Cp}^*(\text{CO})_2\text{Fe}(\text{CH}_2)_3\text{Ru}(\text{CO})_2\text{Cp}]$, $[\text{Cp}^*(\text{CO})_2\text{Fe}(\text{CH}_2)_5\text{Ru}(\text{CO})_2\text{Cp}]$, $[\text{Cp}^*(\text{CO})_2\text{Fe}(\text{CH}_2)_5\text{W}(\text{CO})_3\text{Cp}]$, and $[\text{Cp}(\text{CO})_2\text{Ru}(\text{CH}_2)_5\text{W}(\text{CO})_3\text{Cp}]$; *Journal of Organometallic Chemistry* Volume 692, Issue 12, 15 2456-2472, <https://doi.org/10.1016/j.jorganchem.2007.02.016>
7. **E.O. Changamu**, H.B. Friedrich, M.O. Onani, M. Rademeyer, 2006. Reaction studies on some functionalized alkyl transition metal compounds and the crystal structure of $[\text{Cp}(\text{CO})_3\text{W}\{\text{CH}_2\}_3\text{NO}_2]\text{PF}_6$, *Journal of organometallic chemistry* 691 (22), 4615-4625
8. H.B. Friedrich, **E.O. Changamu**, M. Rademeyer, 2006. $[\mu\text{-}1\kappa\text{C}1:2(\text{C}2, \text{C}3\text{-}\eta)\text{-Allyl}]\text{tetracarboxyl-}1\kappa^2\text{C}, 2\kappa^2\text{C-(}1\eta^5\text{-cyclopentadienyl)}(2\eta^5\text{-pentamethylcyclopentadienyl})$ rutheniumiron hexafluorophosphate, *Acta Crystallographica Section E: Structure Reports Online* 62 (3), m405-m407
9. **E.O. Changamu**, H.B. Friedrich, M. Rademeyer, 2006. $[\mu\text{-}1\kappa\text{C}1:2(\text{C}2, \text{C}3\text{-}\eta)\text{-Allyl}]\text{tetracarboxyl-}1\kappa^2\text{C}, 2\kappa^2\text{C-(}1\eta^5\text{-cyclopentadienyl)}(2\eta^5\text{-pentamethylcyclopentadienyl})$ diiron (II) hexafluorophosphate, *Acta Crystallographica Section E: Structure Reports Online* 62 (3), m442-m444; DOI: 10.1107/S1600536806003503

Books and Books Chapters

Lewis Whitehead, **Evans Ogwagwa Changamu**, Nina Dudnik, Patrick McCarren, Rajiv Chopra, Rem R Fazio, David Qualter, Vinod Patel, Ryan Haas, Khampoua Naovarangsy, Bhaveshkumar Gami, Christopher Harwell, Jeffrey D Madura, Heather Burks, Solomon Derese, Michelle Lynn Hall, Ralph Greenberg, Sean Ohlinger, Juliette Pradon, Bryan R Henry, Linda Wang, Lucy Kiruri, Colleen Dionne, Brigitta TadmorJobs, 2015. Collaborations, and Women Leaders in the Global Chemistry Enterprise, Edition: ACS Symposium Series 1195, Chapter: 16, Publisher: ACS Books, Editors: H. N. Cheng, Marinda Li Wu, Bradley D. Miller, pp.153-1674-

Conference/Workshops/Seminar Papers

Conference Papers

1. Mariah Onditi, Geoffrey Bosire, Evans Changamu and Catherine Ngila, 2016. Preparation and characterization of polyvinyl alcohol/hemicellulose nanofibers via electrospinning for

- removal of natural organic matter (NOM) from waste water. The OWSD 5th General Assembly and International Conference in 16-19 May 2016, Kuwait.
2. Mariah Onditi, **Evans Changamu** and Catherine Ngila, 2015. Extraction and characterization of hemicellulose from wild species of cactus plant (*Opuntia ficus indica*) with application in water purification Materials, Analytical and Physical Electrochemistry Today (MAPET) 3rd International Symposium on Electrochemistry ElectrochemSA, SACI Bellville, SOUTH AFRICA 26 - 28 May 2015.
 3. Mariah Onditi, **Evans Changamu** and Catherine Ngila, 2015. Utilization of cactus hemicellulose based biopolymer for water treatment 3rd Conference on Emerging Frontiers For Sustainable Water: A Trilateral Partnership Africa India UK: Protea Hotel Wanderers, Illovo Johannesburg 3-5 August 2015.
 4. Mariah Onditi, **Evans Changamu** and Catherine Ngila, 2015. Adsorption of heavy metals from aqueous solution using hemicellulose isolated from cactus plant presented at the 16th WaterNet/WARFSA/GWP SA Symposium, held in Mauritius on 28 - 30 October 2015
 5. Mariah Onditi, **Evans Changamu** and Catherine Ngila, 2015. Electrospun Hemicellulose-based Polymer Nanofibers Utilized for Water Treatment presented at the Materials Research Society 2015 Fall Meeting in Nov 29-Dec 4, 2015, in Boston, Massachusetts, USA.
 6. **Evans C. Ogwagwa**, C. M'thiruaine and H.B. Friedrich, Water-soluble organometallics of biologically relevant metals and ligands, Fifth annual Ghana Biomedical Convention, in Accra Ghana between 30th July– 1st August 2012.
 7. Evans O Changamu, The role of chemistry in industrial development - The contribution of transition metals, a paper presented during the Kenya Chemical Society seminar as part of the International Year of Chemistry Celebrations on 30th April 2011 at Kenyatta University.
 8. Evans O. Changamu, Water-soluble organometallic complexes, paper presented as poster during the monthly poster presentations at Novartis Institutes for Biomedical Research held on 20th August 2010, at Cambridge, Massachusetts, USA.
 9. Evans O. Changamu, Complexes of Organometallic Lewis acids, presented at Harvard University, Department of Chemistry and Chemical biology on 23rd July 2010 USA.
 10. Evans O. Changamu, and Holger B. Friedrich "Synthesis and structure of the cationic heterobimetallic complex $[\text{Cp}^*(\text{CO})_2\text{Fe}\{\eta^2\text{-CH}_2\text{CH}(\text{CH}_2)_3\}\text{W}(\text{CO})_3\text{Cp}]\text{BPh}_4$ ($\text{Cp}^* = \eta^5\text{-C}_5(\text{CH}_3)_5$; $\text{Cp} = \eta^5\text{-C}_5\text{H}_5$)", paper presented as poster during the 38th International Conferences on Coordination Chemistry held between 20 – 25 July, 2008 at Renaissance Hotel, Jerusalem (Israel)
 11. Evans O. Changamu, and Holger B. Friedrich, 2007. Synthesis and Characterization of Some Transition Metal-Stabilised Carbocations, SACI Conference on Inorganic Chemistry (INORG 007) held at Club Mykonos, July 2007.

Workshops Papers

Evans Changamu, 2016. Teaching and Coverage of Inorganic Chemistry at Undergraduate Level presented at the National workshop on the overview of trends in teaching and research in inorganic chemistry and its applications in Kenya at University of Nairobi, 12 – 13 May 2016

Seminar Papers

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Student Co-authored Publications

1. Adamu Abdulhameed, Harun M. Mbuvi*, **Evans O. Changamu**, 2020. Synthesis of Cellulose-Based Superabsorbent Hydrogel from Rice Husk Using a Microwave, American Journal of Materials Science, 10(1): 1-8; DOI:10.5923/j.materials.20201001.01

2. Mariah Onditi,* Geoffrey Bosire, **Evans Changamu**, and Catherine Ngila, 2019. Degradation of Rhodamine B Dye by Cactus Polysaccharide-Synthesized Silver Nanoparticles Monitored by Fluorescence Excitation-Emission Matrix (FEEM) Spectroscopy, *Starch - Stärke*, 71, 1800127; DOI: 10.1002/star.201800127
3. Rozy Munene, **Evans Changamu**, Nicholas Korir and Gweyi-Onyango Joseph, 2017. Effects of different nitrogen forms on growth, phenolics, flavonoids and antioxidant activity in amaranth species. *Tropical Plant Research*, 4(1): 81–89
4. R. Munene, **E. Changamu**, N Korir, JP Gweyi-Onyango, 2017. Differential Impact of Nitrogen Forms on Selected Phytochemicals and Oxalate Contents in Three Vegetable Amaranth Varieties in Kenya. *Annals, Food Science and Technology* 18 (2), 238-256
5. Munene Rozy, **Changamu Evans**, Korir Nicholas and P. Gweyi-Onyango Joseph, 2016. Characterization and Documentation of Factors Contributing to Production and Consumption of African Leafy Vegetables (ALVs) in Kiambu and Kirinyaga Counties in Kenya. *Asian Research Journal of Agriculture* 1(3), 1-9
6. Mariah Onditi, Adedeji A. Adelodun, **Evans O. Changamu**, Jane C. Ngila, 2016. Removal of Pb²⁺ and Cd²⁺ from drinking water using polysaccharide extract isolated from cactus pads (*Opuntia ficus indica*). *Journal of Applied Polymer Science* 133(38), 43913, DOI: 10.1002/app.43913
7. Stanslaus M. Lusambili, Alphonse W. Wafula, **Evans C. Ogwagwa**, 2016. Spectroscopic and physical characterization of clays from Ilesi area in Kakamega County and their suitability for pottery, *Journal of the Kenya Chemical Society* 9, 1-14
8. Cyprian M. M’Thiruaine, Holger B. Friedrich, Bernard Omondi, **Evans O. Changamu**, 2013. A Structural Investigation of the D₂O Solvated, Acetone Solvated and Non-solvated 1,4-Diazabicyclo[2.2.2] octane Complexes of the Half Sandwich Moiety [(η⁵-C₅H₅)(CO)₂Fe]. *South African Journal Chemistry*, 66, 237 – 243;
9. Cyprian M. M’thiruaine, Holger B. Friedrich, **Evans O. Changamu**, Bernard Omondi, 2012. Regioselective reactions of electrophilic iron dicarbonyl cations, [(η⁵-C₅R₅)(CO)₂Fe]⁺ (R = H, CH₃) with heterofunctional amine ligands. *Journal of Organometallic Chemistry* 717, 52-60; DOI: 10.1016/j.jorganchem.2012.06.034
10. Cyprian M. M’thiruaine, Holger B. Friedrich, **Evans O. Changamu**, Bernard Omondi, 2012. Syntheses, structural elucidation and reactions of allylamino compounds of the type, [(η⁵-C₅R₅(CO)₂Fe(NH₂CH₂CH=CH₂)]BF₄, *Polyhedron* 40 81–92; DOI:10.1016/j.poly.2012.03.039
11. Cyprian M. M’thiruaine, Holger B. Friedrich, **Evans O. Changamu** and Manuel Fernandes, 2012. Dicarbonyl(hexamethylene-1,3,5,7-tetramine-κN¹)(η⁵-pentamethylcyclopentadienyl) iron(II) tetrafluoridoborate, *Acta Crystallographica* E68, m931; DOI:10.1107/S1600536812026360
12. Cyprian M. M’thiruaine, Holger B. Friedrich, **Evans O. Changamu** and Manuel Fernandes, 2012. Dicarbonyl(η⁵-cyclopentadienyl)(hexamethylene-1,3,5,7-tetramine-κN¹)iron(II) tetrafluoridoborate, *Acta Crystallographica* E68, m1077; <https://doi.org/10.1107/S1600536812031649>
13. Cyprian M. M’thiruaine, Holger B. Friedrich, **Evans O. Changamu** and Muhammad D. Bala, 2012. Reactions of N-heterocyclic ligands with substitutionally labile organometallic complexes, [(η⁵-C₅R₅)Fe(CO)₂E]BF₄ *Inorganica Chimica Acta* 390, 83–94; DOI: 10.1016/j.ica.2012.04.003
14. Cyprian M. M’thiruaine, Holger B. Friedrich, **Evans O. Changamu** and Muhammad D. Bala, 2012. Synthesis, characterization and structural elucidation of water-soluble 1-aminoalkane and α,ω-diaminoalkane complexes of the pentamethylcyclopentadienyliron dicarbonyl cation, [Cp*(CO)₂Fe]⁺ *Inorganica Chimica Acta*, 382, 27–34; DOI:10.1016/j.ica.2011.09.058
15. Cyprian M. M’thiruaine, Holger B. Friedrich, **Evans O. Changamu** and Manuel A. Fernandes, 2012. Dicarbonyl(η⁵-cyclopentadienyl)(2,3-dibromopropanamine-κN)iron(II) tetrafluoridoborate, *Acta Crystallographica*, E68, m932; DOI:10.1107/S1600536812026925

16. Cyprian M. M'thiruaine, Holger B. Friedrich, **Evans O. Changamu** and Bernard Omondi, 2011. (μ -Formato- κ 2O:O')bis[dicarbonyl(η^5 -cyclopentadienyl)iron(II)] tetrafluoridoborate, Acta Crystallographica, E67 m1252; DOI:10.1107/S1600536811032764
17. Cyprian M. M'thiruaine, Holger B. Friedrich, **Evans O. Changamu** and Muhammad D. Bala, 2011. Acetonitriledicarbonyl(η^5 -pentamethyl-cyclopentadienyl)iron(II) tetrafluoridoborate Acta Crystallographica, Section E67 m924. DOI:10.1107/S1600536811021350
18. Cyprian M. M'thiruaine, Holger B. Friedrich, **Evans O. Changamu** and Muhammad D. Bala, 2011. Synthesis and characterization of amine complexes of the cyclopentadienyliron dicarbonyl complex cation, $[\text{Cp}(\text{CO})_2\text{Fe}]^+$ Inorganica Chimica Acta 366, 105-115. DOI:10.1016/j.ica.2010.10.018
19. Cyprian M. M'thiruaine, Holger B. Friedrich, **Evans O. Changamu** and Bernard Omondi, 2011. (μ -Ethane-1,2-diamine- κ 2N:N')bis[dicarbonyl(η^5 -cyclopentadienyl)iron(II)]bis (tetrafluoridoborate) Acta Crystallographica (). E67, m485 DOI: 10.1107/S1600536811010154

Other Publications

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Research

Synthesis and characterization of iron half-sandwich organometallic complexes of haloalkyls and amine ligands. Amine ligands including those of biogenic importance are the focus of our interest. We apply a two-pronged approach i.e. in silico determination of ligation properties of the ligands, the nature and properties of the complexes they form and synthesis and characterization of complexes of the selected ligands. Other areas of interest include characterization of honey in terms of signature volatile organic compounds and materials for various applications including water purification and production of hydrogels.

Funded Projects

- 2017: Curriculum Review for Pharmacy and Chemistry curricular funded by the British DFID through the Strategic Partnership for Higher Education Innovation and Reform consortium. Terminated in February, 2020.
- 2014: The Joint Kenya and South Africa grant from the National Commission for Science, Technology and Innovation (KSh 1,490,000).
- 2012: The Global Innovation Grant (USD 5,000) from the American Chemical society in collaboration with Scientists from Novartis Institutes for Biomedical Research (NIBR).
- Moving domain qm/mm methods for determination of interactions between human estrogen receptor alpha and endocrine disrupters, NRF student funding, 2015, KSh 500,000
- Physicochemical characteristics of mangrove honey from Kilifi County, Kenya, NRF student funding, 2015, KSh 500,000
- Synthesis, characterization, bioassay and density functional theory studies of cationic iron half sandwich complexes of selected heterofunctional active pharmaceutical agents, NRF PhD student funding, 2015, KSh 1.5 million

Conferenced/Workshops/Seminars Attended

Conferences Attended

- The 9th Kenya Chemical Society International Conference on 'The Role of Chemistry in Inventing a Sustainable Future,' May 9-12th, 2017, USIU, Nairobi, Kenya.

- The 8th Kenya Chemical Society International Conference, held at University of Nairobi, College of Physical and Biological Sciences, Chiromo Campus between 5th – 8th May, 2015
- Fifth annual Ghana Biomedical Convention, in Accra Ghana between 30th July– 1st August 2012.
- The Kenya Chemical Society seminar as part of the International Year of Chemistry Celebrations on 30th April 2011 at Kenyatta University.
- The 38th International Conferences on Coordination Chemistry held between 20 – 25 July, 2008 at Renaissance Hotel, Jerusalem (Israel).

Workshops Attended

- CEPU IdeaShop Online workshop "Involving external stakeholder into the academic process" on the 10th of December, 2020
- AAU zoom virtual workshop on quality assurance in higher & tertiary education marketing & digital marketing held on Tuesday 6th October, 2020
- AAU zoom virtual workshop on quality assurance in records, library & examinations 24th September 2020
- Kenya Chemical Society virtual workshop on Packaging chemistry content for virtual learning during the COVID-19 pandemic held on July 23, 2020
- Strategic Partnership for Higher Education Innovation and Reform Portfolio workshop, Ole Sereni Hotel, Nairobi, 1-5th October 2018.

Seminars Attended

- Research Dissemination Webinar For Supervisors Organized By The Graduate School, Kenyatta University Friday, 19th March, 2021
- Transforming employability for social Change, Webinar by Association for Faculty Enrichment in Learning and Teaching (AFELT) in collaboration with Eider Africa and Xponentially on Thursday 1st October 2020
- Quality assurance in journal establishment, management/maintenance & sustainability-part II. Association of African Universities (AAU) zoom virtual workshop on held on 20th October, 2020, 14.15 hrs
- Journal Establishment, Management/Maintenance & Sustainability, Association of African Universities (AAU) zoom virtual workshop on held Tuesday 13th October 2020

Supervision of Postgraduate Students

Masters

- Ten (10) Completed
- Five (5) Ongoing

Ph. D

- Five (5) completed
- Two (2) ongoing

Professional/ Consultancy (Editor/ Peer review in journals, Networks/ Collaborations, External Examiner, Patents)

- April 2020: External examiner, MSc Thesis University of Johannesburg, South Africa
- October 2018: External examiner, PhD Thesis University of the Western Cape, South Africa.
- May 2016: External examiner, PhD Thesis University of the Western Cape, South Africa.

- September 2015: External examiner, PhD Thesis University of KwaZulu-Natal, South Africa.
- October 2013: External Examiner, PhD Thesis Bharathiar University, Coimbatore, India
- September 2013: National Research Foundation (NRF) Peer reviewer
- May 2012: External Examiner, MSc Thesis, Maseno University, Kenya

- 2015: Reviewer, Analytical Letters
- 2015: Reviewer, Journal of Water Reuse and Desalination
- 2014-2015: Reviewer, Journal of the Kenya Chemical Society
- 2013 to date: NRF Peer Reviewer,

Community Service and Other Engagements

- ~ March 2021: Elected member of Uthabiti SACCO management Board
- ~ 2010 to date: Chairman, Men's ministry Deliverance Church Kahawa Sukari
- ~ 2014 to April 2018: Founder member and member of supervisory committee, Uthabiti SACCO
- ~ 2013 to Date: Member of Local Church Council, Deliverance Church Kahawa Sukari
- ~ 2012: Chairman, organizing committee of the second free medical camp held in December 2012, at Deliverance church Kizito (Mwihoko) grounds.

Professional Bodies

-Kenya Chemical Society

National and International awards and Recognitions

- September 2019 to date: Member of the Kenya Bureau of Standards (KEBS) Technical Committee on ceramics
- 2012 to date: Member of the Kenya Bureau of Standards (KEBS) Technical Committee on Rubber and Rubber Products

Administrative Positions Held

Recognized university administrative positions

2014 to Jan 2018: Departmental Examinations Coordinator, Department of Chemistry

Other administrative positions Held

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