BRIEF CURRICULUM VITAE FOR DR EMMANUEL TEBANDEKE

1. Personal Information

Name:	Dr. Emmanuel Tebandeke
Nationality:	Ugandan
Date of Birth:	December, 1977
Address:	Department of Chemistry College of Natural Sciences Makerere University, P. O. Box 7062, Kampala
Current Position	Senior Lecturer and Head Department of Chemistry, Makerere University
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2. Academic Qualifications

(a) PhD (Chemistry), Makerere University, 2013.
(b) Licentiate of Philosophy (Coordination Chemistry), Lund University Sweden, 2009.
(c) MSc. (Chemistry), Makerere University, 2005.
(d) B.Sc. (Chemistry, Geology), Makerere University, 2000.

3. Summary of Professional Skills and Expertise

- I have over 20 years of experience as a Scholarly Scientist based at the Department of Chemistry, Makerere University, where I currently hold the position of Senior Lecturer and Head of the Department. I am actively involved in Teaching, Research and Consultancy Work. My research work is mainly focused on the study of fate and transport of pollutants in the environment; application of green chemistry in industrial processing; and environmental pollution remediation.
- I have more than 12 years of professional knowledge and experience in chemicals and waste management field and I have supported several Government programmes on environmentally sound management of chemicals and waste in including Persistent Organic Pollutants POPs.
- I have served as a Chair, Co-Chair or Member on a number of National Coordination and Steering Committees for different Programmes and Projects on sound management of POPs and other Chemicals and associated Waste in Uganda, implemented by different Government MDAs related to International Conventions and Agreements including the Stockholm, Rotterdam, Bamako, Basel and Minamata Conventions.
- I have been a lead consultant and coordinator for a number of projects including development and validation of PCB inventories in Uganda under the Ministry of Energy and Mineral Development; lead pollution mitigation project in Uganda under the Global alliance on health and pollution (GAHP); and Lead exposure elimination in the paint industry, under the Lead exposure and elimination project (LEEP).
- I have been a Principal Investigator and co-researcher on a number of internationally funded research projects, some of which are on-going in areas of green chemistry and green processing research; and environmental remediation.
- As a scholar I have published several articles and book chapters in high impact factor peer reviewed journals, and I am a reviewer of scientific papers for several reputable scientific journals.

- I have been a lead or expert on a number of joint consultancy tasks for environmental impact assessment, environmental audit, air quality assessment, environmental remediation and pollution assessment.
- I have had training in green chemistry and green processing; environmental impact assessment; environment management; laboratory management; sustainable and renewable energy resources, conversion of waste into useful chemical products.

4. Selected National Steering Committee and Consultancy Services

- Currently, I am a lead consultant of a Project on PCB inventory update and validation and development of strategies for their disposal in Uganda, under the Ministry of Energy and Mineral Development funded by the Basel, Rotterdam and Stockholm (BRS) Secretariats/The United Nations Environment Programme (UNEP).
- Currently, I am also the Chair for a National Coordinating Committee for a Project on Global Development, Review and Update of National Implementation Plans (NIPS) under the Stockholm Convention on Persistent Organic Pollutants (POPs), implemented by the National Environment Management Authority (NEMA) with support from the UNEP. 2023-2025.
- 2024-2025, Coordinator for a lead exposure mitigation project in Uganda, under the Global Alliance on Health and Pollution (GAHP) in Collaboration with the National Environment Management Authority (NEMA) with support from Pure Earth.
- I am also a member on a Multi-Sectoral Committee on sound management of Chemicals and Associated Waste, for a Project on Strengthening National Capacity to implement control procedures under the Rotterdam, Stockholm, Basel and Minamata Conventions in Uganda, implemented by the Ministry of Water and Environment with support from the UN Environment Special Programme, 2023-2025.
- In 2019-2022, I served as a Co-Chair of a Multi-Sectoral Technical Committee under a UNEP Project on Strengthening National Institutional Capacity on Sound Management of Chemicals and Waste in Uganda, implemented by NEMA.
- In 2018-2021, I also served as a member on a technical committee for reviewing and development of National Environment Air Quality Regulations, for Uganda 2020, implemented by NEMA under the Oil for Development Programme.
- In 2020-2021, I also served as a member on a committee for reviewing the draft chemical regulations for the Chemicals and Waste in Uganda, under NEMA.
- Consultancy work as a pollution expert during the environmental and social impact assessment (ESIA) for the expansion of Kinyara sugar works-joint work with PROESS.
- Consultancy work as a pollution expert during ESIA for Century Bottling Company, Mbarara Plant-Joint Work with Geotaxon Consults (U) Ltd.
- Pollution expert on the assessment of asbestos pollution at Century Bottling Company, Mbarara Plant-Joint Work with Geotaxon Consults (U) Ltd.
- Pollution expert on the assessment of microbiological air quality at Century Bottling Company, Mbarara Plant-Joint Work with Geotaxon Consults (U) Ltd.
- Consultancy and advisory work for construction and optimization of a sewage treatment plant by CIDI in Kampala City.
- Collaboration with Africa Power Initiative to produce biodiesel from non-edible plant oils and plastic waste.
- Pollution monitoring (Air and effluents) for several industries in Uganda including but not limited to Roofings Rolling Mills Ltd, Pearl Engineering Ltd and Green Label Ltd.

5. Selected Research Activities

I am a Principal Investigator (PI) for a Project on development of industrial processes for the conversion of greenhouse carbon dioxide into useful chemical products including fuels, drug intermediates and biodegradable packaging materials, supported by the International Science Programme (ISP). I am also a PI for a project on remediation of mercury contaminated sites in Artisanal and Small-scale Gold Mining Areas of Uganda, which is supported by Makerere University Research and Innovation Fund (Mak-RIF). I am a Co-PI on a project on sustainable commercial biodiesel production from mon-edible plants and waste. Other on-going research activities include pollution monitoring and mitigation, conversion of plastic waste into energy storage materials, and development of sustainable industrial processes.

6. Research Grants Management

I have been the Principal Investigator (PI) for the following research grants:

(i) 2022-todate: Grant amount 2,200,000 SEK extension of funding for the green chemistry project activities supported by the International Science Programme (ISP) /International Programme in Chemical Sciences (IPICS).

(ii) 2021-2022: Grant amount UG shs 100,000,000, from Government of Uganda and Makerere University, Research and Innovation Fund to support soil remediation studies in artisanal and small-scale gold mining areas of Uganda.

(iii) 2019-2021: Grant amount 1,700,000 SEK extension of funding for the green chemistry project activities supported by the International Science Programme (ISP) /International Programme in Chemical Sciences (IPICS).

(iv) 2019-2020: Grant amount UG shs 104,000,000, from Government of Uganda and Makerere University, Research and Innovation Fund to support soil remediation studies in artisanal and small-scale gold mining areas of Uganda.

(v) 2016-2018: A Grant amount of 1,220,000 SEK from the International Science Programme (ISP) /International Programme in Chemical Sciences (IPICS) to support research in development of catalytic process for green processing.

7. Work Experience

(a) 2021 to date: Senior Lecturer and Head, Department of Chemistry, Makerere University

Summary of activities undertaken during my employment tenure in the Departments of Chemistry, Makerere University

(i) Head, Department of Chemistry, Makerere University.
(ii) Teaching a number of courses to undergraduate and graduate students.
(iii) Supervision of research for undergraduate and graduate students.
(iv) Development of study materials for undergraduate and graduate students.
(v) Research

(b) 2013 to 2021: Lecturer, Department of Chemistry, Makerere University

Summary of activities undertaken during my employment tenure in the Departments of Chemistry, Makerere University

(i) Teaching a number of courses to undergraduate and graduate students.
(ii) Supervision of research for undergraduate and graduate students.
(iii) Development of study materials for undergraduate and graduate students.

(iv) Research

c) 2006 to 2012: Assistant Lecturer, Department of Chemistry, Makerere University

Summary of activities undertaken during my employment tenure in the Departments of Chemistry, Makerere University

(i) Teaching a number of courses to undergraduate students.
(ii) Supervision of research for undergraduate students.
(iii) Development of study materials for undergraduate students.

8. Selected Publications

(i) Mbabazi, Ruth., Nyanzi, S.Allan., Naziriwo, Betty., Ojwach, S.O., Folkers, L.C., Wendt, O.F., **Tebandeke, Emmanuel.,** 2024. Highly efficient CO_2 and propylene oxide co-polymerization using Zn glutarate/Zn-Cr double metal cyanide composite catalyst. Sustain. Chem. Clim. Action 4, 100037. https://doi.org/https://doi.org/10.1016/j.scca.2023.100037.

(ii) **Emmanuel Tebandeke**, Irene O. Atuko, Betty Naziriwo, Reine Wallenberg, Ola F. Wendt, One pot synthesis of styrene carbonate from carbon dioxide and styrene in water catalyzed by nano-silver modified polyoxometalates, Sustain. Chem. Environ. (2023) 100016. https://doi.org/https://doi.org/10.1016/j.scenv.2023.100016.

(iii) Godwin Aturagaba, Dan Egesa, Edward Mubiru and **Emmanuel Tebandeke**, Catalytic Hydrothermal Liquefaction of Water Hyacinth to form Biofuels Using Fe_3O_4/NiO Nanocomposite: Optimization of Reaction Conditions by Response Surface Metho-dology, (2023), Journal of Sustainable Bioenergy Systems, 13, 73-98. https://doi.org/10.4236/jsbs.2023.133005.

(iv) Ssenku, Jamilu E., Betty Naziriwo, Jennifer Kutesakwe, Abubakar Sadik Mustafa, Derrick Kayeera, and **Emmanuel Tebandeke**. (2023). "Mercury Accumulation in Food Crops and Phytoremediation Potential of Wild Plants Thriving in Artisanal and Small-Scale Gold Mining Areas in Uganda" *Pollutants* 3, no. 2: 181-196. https://doi.org/10.3390/pollutants3020014.

(v) Moses Kigozi, **Emmanuel Tebandeke**, John Baptist Kirabira & Gabriel N. Kasozi (2023) Solvo/hydrothermal upcycling of polyethylene plastic-waste into carbon-based nanocomposite for supercapacitor application, Materials Science and Technology, DOI:10.1080/02670836.2023.2215646.

(vi) Moses Kigozi, Gabriel N. Kasozi**, Emmanuel Tebandeke**, Salluri Aswini, Tanarapu V. Anusha, P awan K. Jain, J ohn B. Kirabira, Electrochemical exfoliation and deposition of sodium-graphene oxide composite for high specific capacity cathode/anode for dual-carbon sodium ion battery application, Chem. Phys. Lett. 822 (2023) 140499. https://doi.org/https://doi.org/10.1016/j.cplett.2023.140499.

(vii) Moses Kigozi, Gabriel N. Kasozi, Sachin Balaso Mohite, Sizwe Zamisa, Rajshekhar Karpoormath, John Baptist Kirabira and **Emmanuel Tebandeke** (2023) Non-emission hydrothermal low-temperature synthesis of carbon nanomaterials from poly (ethylene terephthalate) plastic waste for excellent supercapacitor applications, Green Chemistry Letters and Reviews, 16:1, DOI: 10.1080/17518253.2023.2173025.

(viii) Shehu , Z., Nyakairu , G. W. A., **Tebandeke , E**. and Odume, O. N. (2023) "Circular Economy Approach for Treatment of Water-Containing Diclofenac Using Recyclable Magnetic Fe3o4 Nanoparticles: A Case Study of Real Water Sample from Lake Victoria", *Journal of Pharmaceutical Research International*, 35(22), pp. 66–81. doi: 10.9734/jpri/2023/v35i227417.

(ix) Esther Kinyua, George Nyakairu, **Emmanuel Tebandeke**, Nelson Odume, Photocatalytic Degradation of Microplastics: Parameters Affecting Degradation, Adv. Environ. Eng. Res. 05 (2023) 39. https://doi.org/10.21926/aeer.2303039.

(x) Ruth Mbabazi, Ola F. Wendt, Steven Allan Nyanzi, Betty Naziriwo, **Emmanuel Tebandeke,** Advances in carbon dioxide and propylene oxide copolymerization to form poly(propylene carbonate) over heterogeneous catalysts, Results Chem. 4 (2022) 100542. https://doi.org/https://doi.org/10.1016/j.rechem.2022.100542.

(xi) Moses Kigozi, Blessing N. Ezealigo, Gabriel N. Kasozi, **Emmanuel Tebandeke** and John Baptist Kirabira, The Science of High-Energy Graphene Oxide–Based Materials for Hybrid Energy Storage Applications, (2022), Book Chapter in Graphene Oxide in Enhancing Energy Storage Devices (1st ed.). CRC Press. https://doi.org/10.1201/9781003215196.

(xii) Zaccheus Shehu, George William A. Nyakairu, **Emmanuel Tebandeke**, Nelson Odume, Overview of African water resources contamination by contaminants of emerging concern, Sci. Total Environ. 852 (2022) 158303. https://doi.org/https://doi.org/10.1016/j.scitotenv.2022.158303.

(xiii) Ibrahim Karume, Simon Tewolde, **Emmauel Tebandeke**, Ishak Mukasa and Ruth Mbabazi, R. (2022) Efficiency of Crude α-Cyclodextrin in Gold Recovery from Electronic Waste and Soil. *Green and Sustainable Chemistry*, **12**, 73-82. doi: 10.4236/gsc.2022.123006.

(xiv) Simon Lukato, Gabriel N. Kasozi, Betty Naziriwo, **Emmanuel Tebandeke**, Glycerol carbonylation with CO_2 to form glycerol carbonate: A review of recent developments and challenges, Curr. Res. Green Sustain. Chem. 4 (2021) 100199. https://doi.org/https://doi.org/10.1016/j.crgsc.2021.100199.

(xv) Simon Lukato, Ola.F. Wendt, Reine Wallenberg, Gabriel N. Kasozi, Betty Naziriwo, Axel Persson, Laura C. Folkers, **Emmanuel Tebandeke**, Selective oxidation of benzyl alcohols with molecular oxygen as the oxidant using Ag-Cu catalysts supported on polyoxometalates, Results Chem. **3** (2021) 100150. https://doi.org/https://doi.org/10.1016/j.rechem.

(xvi) Stuart Ben Mukiibi, Steven Allan Nyanzi, Justus Kwetegyeka,Chijioke Olisah, Adewale Mathew Taiwo, Edward Mubiru, **Emmanuel Tebandeke**, Henry Matovu, Silver Odongo, Juma John Moses Abayi, Emily Chelangat Ngeno, Mika Sillanpää, Patrick Ssebugere. Organochlorine pesticide residues in Uganda's honey as a bioindicator of environmental contamination and reproductive health implications to consumers. *Ecotoxicol Environ Saf.*, **214**, 112094 (2021). doi: 10.1016/j.ecoenv.2021.112094.

(xvii) Fiona Nakibuule, Steven Allan Nyanzi, Igor Oshchapovsky, Ola F. Wendt and **Emmanuel Tebandeke**, Synthesis of cyclic carbonates from epoxides and carbon dioxide catalyzed by talc and other phyllosilicates. *BMC Chemistry* **14,** 61 (2020). https://doi.org/10.1186/s13065-020-00713-2.

(xviii) Irene Nalumansi, Grace Birungi, Brenda Moodley and **Emmanuel Tebandeke**, Spectrophotometric Determination of Low Levels of the Orthophosphate Anion as Molybdenum Blue Using Sodium Thiosulphate Reducing Agent. *Orient. J. Chem*, **36**, 6 (2020). http://dx.doi.org/10.13005/ojc/360608.

(xix) Moses Kigozi, Richard K. Koech, Orisekeh Kingsley, Itohan Ojeaga, **Emmanuel Tebandeke**, Gabriel N Kasozi, Azikiwe P Onwualu, Synthesis and characterization of graphene oxide from locally mined graphite flakes and its supercapacitor applications. *Results in Materials*, **7**, 100113 (2020). https://doi.org/10.1016/j.rinma.2020.100113.

(xx) Aziz Kimera Mukota, Melanie Flore Kamini Gondam, Julie Judith Takadong Tsafack, James Sasanya, Wim Reybroeck, Muhammad Ntale, Steven Allan Nyanzi and **Emmanuel**

Tebandeke, Primary validation of Charm II tests for the detection of antimicrobial residues in a range of aquaculture fish. *BMC Chemistry* **14,** 32 (2020). https://doi.org/10.1186/s13065-020-00684-4.

(xxi) Irene Nalumansi, Grace Birungi, Brenda Moodley and **Emmanuel Tebandeke**, Preparation and Identification of Reduced Phosphomolybdate via Molybdenum Blue Reaction. *Orient. J. Chem*, **36**, 4 (2020). http://dx.doi.org/10.13005/ojc/360403.

(xxii) Ibrahim Karume, **Emmauel Tebandeke**, Joloccam Mbabazi, Henry Ssekaalo and Ola.F. Wendt; C-C cross-coupling reactions by palladium on barium and potassium polyoxotungstate supports, Asian J. Chem.30, 2357-2360 (2018). DOI: 10.14233/ajchem.2018.21508.

(xxiii) Abson Richard Asiima, Jolocam Mbabazi, **Emmanuel Tebandeke**, Muhammad Ntale, Trace metal and nutrient constitution of rain water and sediment/sludge harvested in various storage tanks from galvanized iron roof tops in Kampala City, Uganda, *Carib.j.SciTech*,.**3**, 718-730 (2015).

(xxiv) **Emmanuel Tebandeke**, Cristina Coman, Kevin Guillois, Griffin Canning, Evren Ataman, Jan Knudsen, L. Reine Wallenberg, Henry Ssekaalo, Joachim Schnadt and Ola F. Wendt, Epoxidation of olefins with molecular oxygen as the oxidant using gold catalysts supported on polyoxometalates. *Green Chem.*, **16** (3), 1586 (2014). https://doi.org/10.1039/C3GC42198H.

(xxv) **Emmanuel Tebandeke**, Henry Ssekaalo and Ola F. Wendt, Highly efficient epoxidation of olefins with hydrogen peroxide oxidant using modified silver polyoxometalate catalysts. *AJPAC*, **7** (2), 50-55 (2013). https://doi.org/10.5897/AJPAC12.060.

9. Selected research work with graduate students

(i) **Maurice Ayebazibwe**-MSc Research on Coupling of Carbon Dioxide with Epoxides to Form Cyclic Carbonates using Manganese based-Polyoxometalate Metal Organic Frameworks.

(ii) **Resty Nazziwa**-MSc Research on Synthesis of carbamates from carbon dioxide, alcohols and amines catalyzed by cobalt-based polyoxometalates metal organic frameworks.

(iii) **John Ssekatawa**-MSc Research on Direct oxidative carboxylation of olefins catalyzed by iron-based polyoxometalate metal organic frameworks.

(iv) **Derrick Kayeera**-Mercury bioavailability in soils and its uptake by food crops grown around artisanal and small-scale gold mining areas of Eastern Uganda.

(v) **Kinyua Esther Mbuci**-PhD Research on Photocatalytic degradation of microplastics in water using metal modified TiO_2 catalysts.

(vi) **Zaccheus Shehu**-PhD Research on Synthesis and characterization of magnetic iron oxide based nanocomposites for removal of selected contaminants of emerging concern from wastewater.

(vii) **Godwin Aturaga**-PhD Research on Catalytic hydrothermal treatment of bio-crude from hydrothermal liquefaction of water hyacinth: Catalyst screening and optimization of reaction conditions, at the Department of Chemistry Makerere University.

(viii) **Daniel Kalerembe**-MSc Chemistry Research on Catalytic hydrothermal liquefaction of plastic waste into fuels using Pd/Fe_3O_4/zeolite composite catalyst, at the Department of Chemistry Makerere University.

(ix) **Moses Kigozi**-PhD Chemistry Research on conversion of selected plastic waste into carbon nanomaterials for application in the adsorption of carbon dioxide and energy storage, at the Department of Chemistry Makerere University-on.

(x) **Fiona Nakibuule**- MSc Research Title CO_2 and epoxide coupling using zeolite based catalysts to produce cyclic carbonates, at the Department of Chemistry Makerere University.

(xi) **Ruth Mbabazi**-PhD Research Title "Co-polymerization of CO_2 and epoxides to form biodegradable polymers using Zinc supported catalysts", at the Department of Chemistry Makerere University-on-Finalist.

(xii) **Simon Lukato**- MSc Research Title "Catalytic oxidation of olefins using heterogeneous catalysts and molecular oxygen oxidant", at the Department of Chemistry Makerere University.

(xiii) **Kasumba Wilson**- MSc Research Title "Assessment of mercury levels in selected environmental systems around ASGM areas in Uganda", at the Department of Chemistry Makerere University.

(xiv) **Bridget Nakyanzi Kakooza**-MSc Research Title "Levels of Microplastics along Nakivubo Channel and Murchison Bay, Lake Victoria".

(xv) **Jennifer Kutesakwe**- MSc Research Title "Assessment of the state of ambient air quality within Kampala City and selected neighbouring areas", at the Department of Chemistry Makerere University.

10. Referees

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