

# IBRAHIM KARUME

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## Academic Qualifications

**2012-2017:** **Ph.D. in Chemistry**, King Fahd University of Petroleum & Minerals, Dhahran, Kingdom of Saudi Arabia

**2008-2011:** **M.Sc. in Chemistry**, Makerere University, Kampala, Uganda

**2004-2008:** **B.Sc.**, Makerere University, Kampala, Uganda

## Professional Experience

**2017 to date:** **Lecturer**, Department of Chemistry, Makerere University, Kampala, Uganda

**2012-2016:** **Assistant Lecturer**, Department of Chemistry, Makerere University, Kampala, Uganda

**2012-2016:** **Ph.D. Research Fellow**, King Fahd University of Petroleum & Minerals, Dhahran, Kingdom of Saudi Arabia

**2010-2012:** **Teaching Assistant**, Department of Chemistry, Busitema University, Tororo, Uganda

**2008-2011:** **Research Assistant**, Department of Chemistry, Makerere University, Kampala, Uganda

## **Research Experience**

### **2017- to date** Current Research

- **Waste mitigation**
  - Analysis of waste petroleum products and conversion to valuable petrochemicals
  - Biogas synthesis
  - Recovery of precious from electronic waste
  - Design of water filters from bio-degradable materials

### **2012-2016:** PhD Research Fellow, King Fahd University of Petroleum & Minerals, Dhahran, Kingdom of Saudi Arabia

- Devised a bio-catalyzed route to chiral alcohols using a single enzyme
- Developed encapsulation supports for enzymes in harsh media environments
- Engineered solvent systems that alter enzyme selectivity
- Design Oil-supported metal-organic frameworks

### **2008-2010:** Research Assistant, International Science Program, Makerere University

- Developed polyoxometalate-based catalyst systems for olefin epoxidation
- Developed efficient heterogeneous supports for palladium nanoparticles for cross-coupling reactions

## **Research Interests**

- Chemistry of water environment
- Petrochemistry
- Bio- and Heterogeneous catalysis
- Medicinal chemistry
- Waste recycling
- Energy capture, storage and renewal

## **Awards**

**2016:** Best research article in volume 8 published by ChemCatChem

## **Grants**

1. Makerere University Research and Innovations Funds, No. RIF1/CONAS/006
2. TWAS Research Grants, No. 19-059 RG/CHE/AF/AC\_I – FR3240310151
3. Makerere University Research and Innovations Funds- Special COVID-19
4. Makerere University Research and Innovations Funds, No. MAKRIF/CH/02/21

## Publications:

ProQuest Publication No. 10745924

### Peer-reviewed articles

1. **Ibrahim Karume**, Simon Bbumba, Simon Tewolde, How Medium Affects the Activity and Stereopreference of *Thermoanaerobacter ethanolicus* Secondary Alcohol Dehydrogenase Catalyzed Reduction of Ketones, *Letters in Organic Chemistry*, **2022**,
2. **Ibrahim Karume**, Simon Tewolde, Emmanuel Tebandeke, Is'harq Z. T. Mukasa, Ruth Mbabazi., Efficiency of Crude  $\alpha$ -Cyclodextrin in Gold Recovery from Electronic Waste and Soil, *Green and Sustainable Chemistry*, **2022**, 12, 73-82.
3. Fred Ssepuya, Silver Odongo, Benjamin A. Musa Bandowe, Juma John Moses Abayi, Chijioke Olisah, Henry Matovu, Edward Mubiru, Mika Sillanpää, **Ibrahim Karume**, Charles Drago Kato, Victor Odhiambo Shikuku, Patrick Ssebugere., Polycyclic aromatic hydrocarbons in breast milk of nursing mothers: Correlates with household fuel and cooking methods used in Uganda, East Africa, *Science of the Total Environment*, **2022**, 842, (156892).
4. Mukasa-Tebandekke I. Z., **Karume I.\***, Ssebuwufu J., Wasajja H. Z. and Nankinga R. M., Comparison of Antioxidant, Flavonoid and Polyphenol Content of Three Selected Solanaceae Genera from Kigezi, Southwest Uganda, *Scholars International Journal of Chemistry and Material Sciences*, **2022**, 5, 40-60.
5. Mukasa-Tebandekke I. Z., **Karume I.\***, Ssebuwufu J., Wasajja H. Z. Nankinga R. and Habimana M., How variations in concentrations of metal ions and suspended solids downstream river Rwabakazi in Uganda can be used to study pollution, *Journal of Advances in Chemistry*, **2020**, 17, 44-63.
6. Mukasa-Tebandekke I. Z., **Karume I.\***, Wasajja H. Z. and Nankinga R., Improving Quality of Water from Murchison Bay Using Clay from Chelel, Kapchorwa District, Uganda, *Academic Journal of Chemistry*, **2019**, 4, 102-117.
7. Mukasa-Tebandekke I. Z., **Karume I.\***, Mutesasira J., Wasajja H. Z. and Nankinga R., Biogas Synthesis as Means of Solid Waste Management in Kampala, Uganda, *Scientific Review*, **2019**, 5, 198-204.
8. Mukasa-Tebandekke I. Z., **Karume I.**, Wasajja H. Z. and Nankinga R., Improving Quality of Water Using Natural Nano-Clay Composites: Isotherms Describing Water Purification Using Fe-Montmorillonite from Chelel, Kapchorwa in Uganda, *Open Access Journal of Environmental and Soil Sciences*, **2019**, 3, 366-385.

9. **I. Karume**, E. Tebandeke, J. Mbabazi, H. Ssekaalo and O.F. Wendt; C-C cross-coupling reactions by palladium on barium and potassium polyoxotungstate supports, *Asian J. Chem.* **2018**, *30*, 2357-2360.
10. Musa M. Musa, **Ibrahim Karume**, Masateru Takahashi and Samir M. Hamdan, Nisar Ullah; Stereoinversion of *R* configured secondary alcohols using a single enzymatic approach, *ChemistrySelect*, **2018**, *3*, 10205-10208.
11. Musa M. Musa, Odey Bsharat, **Ibrahim Karume**, Claire Vieille, Masateru Takahashi and Samir M. Hamdan; Expanding the substrate specificity of *Thermoanaerobacter pseudoethanolicus* secondary alcohol dehydrogenase by a dual site mutation, *Eur. J. Org. Chem.* **2018**, 798-805.
12. **Ibrahim Karume**, Masateru Takahashi, Samir M. Hamdan and Musa M. Musa; Deracemization of secondary alcohols using a single alcohol dehydrogenase, *ChemCatChem*. **2016**, *8*, 1459-1463.
13. **Ibrahim Karume**, Musa M. Musa, Odey Bsharat, Masateru Takahashi, Samir M. Hamdan and Bassam El Ali; Dual enzymatic dynamic Kinetic resolution by *Thermoanaerobacter ethanolicus* secondary alcohol dehydrogenase and *Candida antarctica* Lipase b, *RSC Adv.* **2016**, *6*, 96616-96622.
14. Musa M. Musa, Jay M. Patel, Christopher M. Nealon, Chang Sup Kim, Robert S. Phillips and **Ibrahim Karume**; *Thermoanaerobacter ethanolicus* secondary alcohol dehydrogenase mutants with improved racemization activity, *Journal of Molecular Catalysis B: Enzymatic*, **2015**, *115*, 155-159.

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### Conference abstracts

1. Musa M Musa, **Ibrahim Karume** and Samir Hamdan, A single enzymatic approach for deracemization of secondary alcohols, *5<sup>th</sup> International Conference on Green Chemistry and Technology & 6<sup>th</sup> International Conference on Environmental Chemistry and Engineering*, **2017**, *Trends in Green chem*, *3* (2), Rome Italy.
2. **Ibrahim Karume**, Musa M. Musa, Masateru Takahashi and Samir M. Hamdan, Compatibility of *Thermoanaerobacter ethanolicus* Secondary Alcohol Dehydrogenase and *Candida antarctica* Lipase B: An Approach for Dual Enzymatic Dynamic Kinetic Resolution, *CHEMINDIX*, **2016**, *Abstract Ref No. CI2016A-1050*, Manama, Bahrain.
3. **Ibrahim Karume**, Amer El-Batta, Amjad B. Khalil, Musa M. Musa, Masateru Takahashi and Samir M. Hamdan, Racemization of enantiopure alcohols by a xerogel-immobilized

alcohol dehydrogenase in organic solvent, *248<sup>th</sup> ACS National Meeting and Exposition 2014*, ORG 182, San Francisco, USA.

4. Musa, M. M.; **Karume, I.**; Patel, J.; Takahashi, M.; Phillips, R. S.; Hamdan, S. M. Turning alcohol dehydrogenases to racemases, *8<sup>th</sup> Singapore International Chemistry Conference, 2014*, 167, Singapore.
5. **Ibrahim Karume**, Emmanuel Tebandeke, Jolocam Mbabazi, Henry Ssekaalo and Ola F. Wendt, Polyoxometalate supported palladium nanoparticles as efficient heterogeneous catalysts in Suzuki and Heck C-C cross-coupling reactions, *1<sup>st</sup> PACN RSC Green Chemistry Congress 2010*, Addis Ababa, Ethiopia.

### Conference participation

1. **Editor in Chief**, *1st International Conference on Reimagining the Natural Products Industry in Africa, 2021*, Kampala, Uganda.
2. **Attendee**, Impact of Pathogens on Agricultural Production, **2021**, Kampala, Uganda.