

## **John Mburu Kiratu (Ph.D)**

Department of Physical Sciences

University of Embu

P.O BOX 6-60100

E-mail: kiratu.john@embuni.ac.ke

Website: <https://www.linkedin.com/pub/john-kiratu/73/43/822>

---

### **PROFESSIONAL SUMMARY**

- Over 5 years of extensive experience in analytical chemistry & green chemistry
- Extensive knowledge of, and experience in chromatographic, and spectroscopic techniques, sample preparation, and characterization
- Experienced in using HPLC, LC/MS, GC/MS, GC/FID, UV-VIS, FTIR, SFE, SPE, SPME, ASE, UHPLC-DAD
- Extensive experience in supercritical fluid extraction
- Extensive experience in design of experiment
- Excellent analytical, scientific and troubleshooting skills
- Strong written, verbal and interpersonal communication skills

### **ACADEMIC PROFILE**

- **PH.D. Analytical Chemistry**, South Dakota State University, Brookings, SD, USA  
Spring, 2016  
Dissertation: Experimental design approach in supercritical carbon dioxide extraction of essential oils  
  
Advisor: Dr. Douglas E. Raynie
- **M.Sc. Analytical Chemistry**, University of Nairobi, Kenya, Sept. 2010  
Thesis: Electrochemical and spectroscopic characterization of Ferrocene-Thiosemicarbazone ligand and copper complexes  
Advisors: Prof. Geoffrey Kamau  
Prof. Lydia Njenga  
Dr. Peterson Guto
- **BSc., CHEMISTRY**, University of Nairobi, Kenya, Sept. 2007

### **EXPERIENCE**

May 2017 - to date, **Lecturer**, Physical Sciences Department, University of Embu, Kenya.

August 2016 - May 2017, **Part Time Lecturer**, Egerton University, Main Campus, Technical University of Kenya, Main Campus.

2010-May 2016, Chemistry & Biochemistry Department, South Dakota State University, Brookings, SD,

◆ **Graduate Research Assistant**

- Designed supercritical fluid extraction experiments that can be adopted to teaching undergraduate the application of green chemistry principles
- Utilized supercritical carbon dioxide in extraction of essential oils from plants
- Quantified essential oils using GC-MS and GC-FID
- Quantified resveratrol in wine using HPLC-UV, LC-ELSD, UHPLC-DAD
- Explored solvent and solid phase trapping of volatile and semi volatile compounds after supercritical fluid (CO<sub>2</sub>) extraction
- Designed experiment using response surface methodology to screen the interaction and significance of solvent parameters used in trapping volatile and semi-volatile compounds after supercritical (CO<sub>2</sub>) extraction

◆ **Graduate Teaching Assistant**

- Taught undergraduate chemistry laboratory classes
  - General Chemistry I Laboratory (CHEM 112L)
  - General Chemistry II Laboratory (CHEM 114L)
  - Organic and Biochemistry Laboratory (CHEM 108L)
  - Chemistry Survey Laboratory (CHEM106L)
  - Elementary Organic Chemistry Laboratory (CHEM 120L)

Sept. 2007-2010, **Graduate Teaching Assistant**, Chemistry Department, University of Nairobi, Kenya

- Duties included: Supervising and grading laboratory reports

July-October, 2006, **Intern**, under directorate of industrial training program Kenya Industrial Research & Development Institute (K.I.R.D.I), Nairobi, Kenya.

Techniques Learnt.

- Determination of BOD, COD, oil and grease, total hardness and sulphates in water and waste (effluent),
- Determination of active matter in detergents,
- Determination of peroxide value, refractive index, iodine value, free fatty acids, and melting point in oils and fats.
- Determination of oil content, fiber content, moisture, ash, and protein in food and feeds,
- Determination of sulphur and phosphorus in fertilizers.

**SOFTWARE**

DOE++ and ChemDraw

## **HONORS/AWARDS and AFFILIATIONS**

- National Science Foundation travel Award to 19<sup>th</sup> Annual Green Chemistry & Green Engineering Conference, North Bethesda, MD, USA, July, 2015
- Graduate Teaching Certification of Highest Excellence, South Dakota State University center for Enhancement of Teaching and Learning, Brookings, SD, USA, Spring 2015
- Competitive scholarship from ACS to attend the ACS Green Chemistry Summer School, 2012
- Graduate Teaching Assistant Excellence, Department of Chemistry & Biochemistry, South Dakota State University, Brookings, SD, USA, Spring 2012
- Master of Science (M.Sc.) scholarship, University of Nairobi, Kenya, 2007
- American Chemical Society member (ACS)

## **PRESENTATIONS**

- 19<sup>th</sup> Annual Green Chemistry & Green Engineering Conference, North Bethesda, MD 2015, (Poster presentation) *Experimental Design Approach for the Optimization of Extraction and Collection of Volatile Compounds using Supercritical Carbon Dioxide*
- ACS National meeting, Denver, CO, March, 2015 (Oral presentation) *Title Experimental Design Approach for the Optimization of Extraction and Collection of Volatile Compounds using Supercritical Carbon Dioxide*
- ACS Midwest Regional meeting, in Colombia, MO, November 2014 (Oral presentation) *Trapping of Volatile Compounds after Supercritical fluid CO<sub>2</sub> Extraction and Application to Extraction of Essential Oils*
- PITTCON conference & exposition on Analytical Chemistry, Chicago Illinois, March 2014, (Oral presentation) *Supercritical Carbon Dioxide Extraction of Essential Oil from chrysothamnus nauseous (Rabbit Brush) and rhus aromatic (Skunk Brush)*
- ACS Midwest Regional meeting, October 2013 in Springfield, MO (Oral presentation) *Title: Supercritical Carbon Dioxide Extraction of Essential Oil from chrysothamnus nauseous (Rabbit Brush) and rhus aromatic (Skunk Brush)*

## **WORKSHOPS AND CONFERENCES ATTENDED**

- Breaking Bad Chromatography Habits Seminar, Minneapolis, MN. Sponsored by Agilent Technologies, June 2014
- Annual Diversity Summit, Rapid City, SD. Sponsored by SD EPSCoR, Feb. 2014
- Science: Becoming the Messenger Workshop, Chamberlain, SD. Sponsored by SD EPSCoR, June 2012

- ACS Midwest Regional meeting, October 2012, Omaha, NE
- ACS Green Chemistry Summer School, Colorado School of Mines, Golden, CO, July 2012
- Life after Graduate School workshop, Chamberlain, SD. Sponsored by SD EPSCoR and ACS, June 2011
- ACS Midwest Regional meeting, October 2011, St. Louis, MO
- 32<sup>nd</sup> Minnesota Chromatography Forum Spring Symposium, Minneapolis, MN, May 2011
- Adding Value Through Green Chemistry, Minneapolis, MN, Jan. 2011
- Green Chemistry Conference on Sustainability, Sioux Falls, SD, Sept. 2010

### **Publications:**

- **Kiratu, J.;** Raynie D.; *Experimental Design Approach for the Optimization of Collection of Volatile Compounds after Supercritical Carbon Dioxide*. The Journal of Supercritical Fluids. (Submitted)
- **Kiratu, J.;** Raynie D.; *Supercritical Carbon Dioxide Extraction of Essential Oil from *chrysothamnus nauseous* and *rhus aromatic**. The Journal of Supercritical fluids. (In preparation)
- Yinbin Huang<sup>1</sup>, Lin Wei<sup>1</sup>, Xianhui Zhao<sup>1</sup>, James Julson<sup>1</sup>, Changling Qiu<sup>2</sup>, Shanmugapriya Dharmarajan<sup>2</sup>, **John Kiratu**<sup>2</sup>, Douglas Raynie<sup>2</sup>, Ashish Dubey<sup>3</sup> and Qiquan Qiao<sup>3</sup> *Biofuel production using Pd/Zn synergistically catalyzed hydrodeoxygenation applied at bio oil extracted in biomass pyrolysis process*. International Journal of Energy Research Int. J. Energy Res. 2016; 40:1724–1730
- **Kiratu, J.;** Raynie D.; *Aiding the Development of Extraction Procedures with Response Surface Methodology*. LCGC North America (July, 2015) Volume 33, Issue 7, pg. 454–463
- Shouyun Cheng<sup>1</sup>, Lin Wei<sup>1,\*</sup>, Xianhui Zhao<sup>1</sup>, Yinbin Huang<sup>1</sup>, Douglas Raynie<sup>2</sup>, Changling Qiu<sup>2</sup>, **John Kiratu**<sup>2</sup>, and Yong Yu<sup>3</sup>; *Directly catalytic upgrading bio-oil vapor produced by prairie cordgrass pyrolysis over Ni/HZSM-5 using a two stage reactor*. AIMS Energy, 2015, 3(2): 227-240.
- **J. M. Kiratu**, P. M. Nguto, G. N. Kamau L.S, Daniel, EMR Kiremire, K. Kambafwile, K. Chibale, P.J. Rosenthal. *Cyclic voltammetry electrochemical studies of Thiosemicarbazone and Semicarbazone ligands derieved Ferrocene and Pyridyl fragments*. International Journal of Biochemiphysics, (2011) 19,47-55.

- L.S. Daniel, EMR Kiremire, K. Kambafwile, K. Chibale, P.J. Rosenthal, **J. M. Kiratu**, P. M. Nguto, G. N. Kamau. *The FT-IR and malarial biological studies of copper (II) complexes containing Thiosemicarbazone and semicarbazone ligands derived from Ferrocene and Pyridyl fragments*. International Journal of Biochemiphysics, (2010) 18 (1), 8-19