



# THE TECHNICAL UNIVERSITY OF KENYA

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NAME: DR JOHN MWAI MBUGUA



Faculty:	Social Sciences and Technology
School:	Center for Science and Technology Studies
Department:	Science and Technology in Society
Current Designation:	Lecturer, CHEMICAL SCIENCE AND TECHNOLOGY
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Consultation Hours:	*weekdays 11am -1pm

## EDUCATION

LEVEL	QUALIFICATION NAME	INSTITUTION	YEAR
Doctor of Philosophy (PhD)	CHEMISTRY	University of Kwazulu_Natal(South Africa)	2013
Masters of Science (M.Sc.)	CHEMISTRY	JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY(Kenya)	2006
Bachelor of Education (B.Ed)	SCIENCE	KENYATTA UNIVERSITY(Kenya)	1995
Certificate	Kenya certificate of primary Education	Kinale(Kenya)	1985
O level/Equivalent	Kenya Certificate of Secondary Education	Starehe Boy's Centre and School(Kenya)	1989

## WORK EXPERIENCE

PERIOD	INSTITUTION	POSITION
2013 - Todate	Technical University of Kenya (TUK)	Lecturer
2008 - 2012	Kenya Polytechnic University College	Lecturer
16.05 2005 - 01.07.2008	Kenya Polytechnic	Graduate Teacher

#### GENERAL STATEMENT ON RESEARCH AREAS

To investigate, model and understand the Science associated with the chemical and hydraulic interaction of brine and organics with ash dams and heaps during their co-disposal.

Modeling water-brines -coal ash interactions and studying reactions and transformations when in contact with inorganics and organics

Other Areas of Research Interests: • Water and Sanitation Research: water quality, pollutants control and mitigation, innovation of waste management systems and design, Faecal sludge analysis and utilization in agriculture as fertilizer • Biochemical methods designs and development for solid and water waste systems & Bio-remediation • Industrial Chemicals, Air and Water Pollution Control and mitigating systems

#### CURRENT RESEARCH PROJECTS

Hydrogeochemical modeling of the speciation and leaching of fly ash co-disposed with water, brines, and organics	Hydro-geochemical modeling of Environmental systems: Analytical-Environmental Chemistry
Development of Flow Injection-Hydride Generation-Phase Separation Interfaces for the Determination of Arsenic in Natural Waters and Rice Using Atomic Absorption Spectrometry	Analytical-Environmental Chemistry

#### SELECTED PUBLICATIONS

TITLE	LINK TO PULICATION
13th May 2019: Book Published; Book's ISBN-13 (978-3-330-03983-4): ISBN-10 (3330039833); Hydrogeochemical Modeling of the Speciation and Leaching of Fly Ash Co-Disposed with Water, Brines and Organics: A Case Study of Sasol-Eskom Coal Ash Disposal, South Africa;	<a href="https://www.lap-publishing.com/catalog/details/store/gb/book/978-3-330-03983-4/hydrogeochemical-modeling-of-the-speciation-and-leaching">https://www.lap-publishing.com/catalog/details/store/gb/book/978-3-330-03983-4/hydrogeochemical-modeling-of-the-speciation-and-leaching</a>
Mbugua, J.M., Ngila, J. C., Kindness, Demlie, M. Reactive-transport modeling of fly ash-water-brines interactions from laboratory-scale column studies, J. Phys. Chem. Earth (2013). <a href="http://dx.doi.org/10.1016/j.pce.2013.09.016">http://dx.doi.org/10.1016/j.pce.2013.09.016</a>	<a href="http://dx.doi.org/10.1016/j.pce.2013.09.016">http://dx.doi.org/10.1016/j.pce.2013.09.016</a>
Bosire, G. O., Ngila, J. C., Mbugua, J. M. (2015). "Predictive complexation models of the impact of natural organic matter and cations on scaling in cooling water pipes: a case study of power generation plants in South Africa." Physics and Chemistry of the Earth, Parts A/B/C(0). <a href="http://dx.doi.org/10.1016/j.pce.2014.11.007">http://dx.doi.org/10.1016/j.pce.2014.11.007</a>	<a href="http://dx.doi.org/10.1016/j.pce.2014.11.007">http://dx.doi.org/10.1016/j.pce.2014.11.007</a>
• Mbugua, J.M., Ngila, J. C., Kindness, A., Demlie, M. Application of Hydrogeochemical Modeling in Simulating the Transportation of Elements in Fly Ash Heap under Different Disposal Systems in South Africa. J. Phys. Chem. Earth (2014), p. 20. <a href="http://dx.doi.org/10.1016/j.pce.2014.11.011">http://dx.doi.org/10.1016/j.pce.2014.11.011</a>	<a href="http://dx.doi.org/10.1016/j.pce.2014.11.011">http://dx.doi.org/10.1016/j.pce.2014.11.011</a>

#### POSTGRADUATE STUDENTS SUPERVISION

NAME	PROJECT TITLE	PERIOD
Bosire Geoffrey Orina	Multivariate Analysis and Modeling Studies of Stability Constants of Ca and Mg-NOM Complexes in Cool	2013- 2016 Graduated with PhD.

#### EXTRA INFORMATION

#### DESCRIPTION

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Affiliation :  
Member of Kenya Chemical Society (KCS)