

# Curriculum Vitae

## Paul M. Shiundu

*B.Sc. (Nbi); CPGS (Cantab, UK); Ph.D. (UBC, Canada); Postdoctoral Fellow (UoU-USA); FCCS (London, UK); MPSSC (NCST, Kenya)*

### Work Address:

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### PERSONAL DETAILS:

Date of Birth:	19/06/1962	Place of Birth:	Busia District
Nationality:	Kenyan	Marital Status:	Married
Number of Children:	3		

### CAREER DETAILS:

Mar./07 ó current: **Dean**, School of Physical Sciences, University of Nairobi, Kenya.

June/07 ó current: **Acting Principal**, College of Biological & Physical Sciences, University of Nairobi on various diverse dates.

Mar./06 ó Aug./06: **First Dean** (in an Acting capacity) of the Newly established **School of Physical Sciences** of the College of Biological & Physical Sciences following the restructuring of the University of Nairobi, Kenya.

May/06 ó Oct./08: **Head of Analytical Chemistry Division**, Department of Chemistry, University of Nairobi, Kenya.

Oct./03 ó current: **Associate Professor**, Department of Chemistry, University of Nairobi, Kenya.

2003 ó 2006: **Acted as Chairman** of the Department of Chemistry, University of Nairobi, Kenya on various diverse dates.

Feb./02 - Nov./02: Sabbatical Leave on a **Fulbright Senior Research Scholar Award** to conduct a 9-month research at the Department of Chemistry and Geochemistry, Colorado School of Mines, USA.

June/98 ó Oct./03: Senior Lecturer, Department of Chemistry, University of Nairobi, Kenya.

Jan./95 ó June/98: Lecturer, Department of Chemistry, University of Nairobi, Kenya.

Jan./92 - Dec./94: Postdoctoral Research Fellow, "Separation Science and Methodology in Analytical Chemistry", Field Flow Fractionation Research Center (FFFRC), Department of Chemistry, University of Utah (UoU), USA.

Sept./91 - Dec./91: Postdoctoral Research Fellow, "Evaluation of Acoustic Emission Sensing for Control of Process Variables in Polymer Formation", Department of Chemistry, UBC and Dow Chemical Canada Inc., Sania Ontario, Canada.

- Sept./87 - Sept./91: **Ph.D.**, Physical/Analytical Chemistry, ÷Automated Methods Development in Flow Injection Analysisö, University of British Columbia (UBC), Canada.
- 28<sup>th</sup> Sept., 1987: Certificate of Postgraduate Study in Natural Science (CPGS), ÷Time Resolved Molecular Attachment to Excited Atomsö, University of Cambridge, UK.
- Oct./83 - June/86: **B.Sc.** (1<sup>st</sup> Class Hons.), Chemistry, University of Nairobi, Kenya.

### **HONORS and AWARDS:**

- March, 2009: Competitively selected by an ÷**International and Inter-Institutional Expert Commission**ö to participate in three (3) Parts of the ÷International Deansö Course Africa 2009/10 (Part I: May 4 ó 14, 2009 in Osnabruck and Berline Germany; Part II: October/November 2009, 3 parallel workshop for Regional Subgroups; and Part III: February/March, 2010 in Ethiopia). Sponsors are: German Rectorö Conference in cooperation with Alexander-von-Humboldt Foundation and Experts of the University of Addis Abba, Ethiopia, and Moi University, Kenya.
- May, 2004: Awarded a competitive Fellowship by the **Organization for the Prohibition of Chemical Weapons (OPCW)** (from among 20 individuals worldwide) to participate in a three weeks "*Analytical Skills Development Programme 2004*", at The Hague, Netherlands.
- July, 2001: Won a **Fulbright Senior Research Scholar Award** to conduct research at The Department of Chemistry & Geochemistry, Colorado School of Mines, USA for 9 months.
- Sept. 1999: Awarded a Fellowship by the African Centre for Technology Studies to attend a training course on "**Biotechnology and Public Policy**", Nairobi, Kenya.
- Oct., 1990: Won the 1990 **Tomas Hirschfeld Student Award** for most outstanding paper submitted and presented by a graduate student to the 1990 Federation of Analytical Chemistry and Spectroscopy Society (FACSS) International Conference, Cleveland Ohio, USA.
- Sept. 1990: Admitted to the status of Fellow of the **Cambridge Commonwealth Society (FCCS)**, London.
- May, 1988: Won a **Canadian Association of Physicists Scholarship** to attend a workshop on ÷**Advances in Sensors and Their Applications**ö, Montreal, Canada.
- Sept/87; 89; 90: Awarded University Graduate Fellowship (UGF) and Renewal at The University of British Columbia (UBC), Canada.
- Oct., 1987: Worn a Merit Award - **Gandhi Smarak Nidhi Fund** as the best Final Year Student in the Faculty of Science 1985/86, University of Nairobi, Kenya.
- Oct., 1987: Awarded a **Montedison Prize** for the best Final Year Student in the Department of Chemistry, Faculty of Science in 1985/86, University of Nairobi, Kenya.
- June, 1986: Awarded a **Dr. A.C.L. DEöSOUZA Memorial Prize** for best First Year student in the Faculty of Science in 1983/84, University of Nairobi, Kenya.

June, 1986: Won a Cambridge Commonwealth Scholarship to study at the University of Cambridge, UK.

### **MAJOR TASKS & ACCOMPLISHMENTS:**

#### ***National:***

- March, 2010: Nominated by the Vice Chancellor, University of Nairobi, to the National Council for Science & Technology (NCST) Task Force to *Assess the Status of National Research & Development in Kenya*.
- January, 2009: Appointed by the National Council for Science & Technology (NCST) as the National Co-ordinator of an International Atomic Energy Agency (IAEA) project entitled "*Enhancing Research Reactor Utilization and Safety (AFRA)*"; Project Number RAF/4/022. **Objective of Project:** *To optimize the effective utilization and enhance the safety of research reactors to support the socio-economic development in AFRA Member States.*
- August 2006: Appointed by the National Environment Management Authority (NEMA) to the **National Review Panel** for the Global Environmental Facility (GEF) in Kenya.
- Mar/06 ó Sept/06: Member of the **Finance and General Purposes Committee (FGPC)** of the former Kenya Science Teachers College (KSTC).
- Mar/06 ó Sept/06: Member of the **Board of Governors (BOG)** of the former Kenya Science Teachers College (KSTC).
- Dec./05: **Commissioned by The Public Universities Inspection Board (PUIB)** to collect and critically analyze data on staff and students; and critically analyze teaching and research facilities, curricula and quality assurance systems in the Faculties of Sciences at Kenyatta University, University of Nairobi, Moi University, Jomo Kenyatta University of Agriculture and Technology, Egerton University and Maseno University.
- Sept./98 ó 2006: Appointed Chairman of the Technical Committee on "**Soaps and Detergents**" for the The Kenya Bureau of Standards (KeBS).
- Oct./98 ó 2006: Member, Technical Committee on *Soaps and Detergents* at The Kenya Bureau of Standards (KeBS).
- Oct./00 - Dec./02: Appointed Chairman of a 4-member Task Force on "**Nuclear Sciences and Technology Policy (TFNSTP)**" charged with the responsibility of formulating a National Nuclear Science and Technology Policy document for the National Council for Science and Technology (NCST).
- Nov./00 - Dec./02: Appointed the National Co-ordinator of an International Atomic Energy Agency (IAEA) project on "*Radiation Processing for Materials and Environmental Applications (AFRA-IV-1)*"; Project Number RAF2001002. **Objective of Project:** *To facilitate and promote concrete applications of radiation technology in environmental studies and for processing selected material for use in industrial applications.*
- Nov./00 - Dec./02: Appointed the National Co-ordinator of an International Atomic Energy Agency (IAEA) project entitled "*Radiation Processing of Food and Industrial Products (AFRA IV-6)*"; Project Number RAF/8/024.

***Objective of Project: To facilitate and co-ordinate the industrial establishment of radiation processing for food preservation and industrial products.***

- Aug./00 ó Dec./02: Appointed Member of the "**The Physical Sciences Specialist Committee (MPSSC)**" for **The National Council for Science and Technology (NCST)**, Kenya.

***University:***

- March, 2010: Successfully organized the 2<sup>nd</sup> Annual Chromatography & Regulatory Training and Vendor Exhibition in conjunction with ChromAfrica; School of Physical Sciencesø Board Room, Chiromo Campus, University of Nairobi, March 8 ó 19<sup>th</sup>, 2010.
- March, 2010: Successfully organized the 1<sup>st</sup> Annual Current Good Manufacturing Practices (cGMP) Training/Workshop in conjunction with ChromAfrica; School of Physical Sciencesø Board Room, Chiromo Campus, University of Nairobi, March 16 & 17<sup>th</sup>, 2010.
- May, 2009: Appointed by the Vice Chancellor, UoN as **SUPERVISOR** of the 2009/2010 Students Organization of Nairobi University (SONU) Elections.
- May, 2009: Successfully organized the 1<sup>st</sup> East & Central Africa Chromatography Training & Vendor Exhibition in conjunction Nesvax Innovations óResearch & Development Outsourcing; School of Physical Sciencesø Board Room, Chiromo Campus, University of Nairobi, May 25<sup>th</sup> ó 29<sup>th</sup>, 2009.
- April, 2009: Nominated as Interim Chairman, Science Chapter of the University of Nairobi Alumni Association.
- April, 2009: Appointed to a 7-Member Committee of the University Management Board (UMB) on **Research Policy** to make recommendations and justification for the establishment of the Office of the Deputy Vice-Chancellor (Research & Extension) taking into consideration the provisions in the University Statutes.
- April, 2009: Appointed to a 6-Member Deans Sub-Committee to review the **Criteria for Interviews**ö of Academic Staff of the UoN.
- Feb., 2009: Appointed **Chairman** of a 6-member Senate Committee to **Investigate Examination Processes at the Kenya Science Campus**ö.
- Oct., 2008: Appointed member of a Deansø Sub- Committee to **Look at Issues on Inaugural Lectures and Publications based on PhD and Masters Degree Theses**ö.
- May, 2007: **Chairman** of a 6-member Committee set up by the Vice Chancellor, University of Nairobi to Identify Appointable Academic Staff from Kenya Science Teachers College (KSTC) by the University of Nairobi.
- May/07 ó Sep/07: Member of the University of Nairobi Task Force on Take over Kenya Science Teachers College by the University of Nairobi.
- Sept./06 ó Now:**Chairman** of a 6-member Water Group working towards the establishment of a **Water Quality Centre at the University of Nairobi**ö.
- Sept. 2005: Appointed by the University of Nairobi (A Partner Institution of the African Virtual University (AVU) Continent-Wide Teacher Education Program) as a **Subject Matter Expert (SME)** for the Chemistry Curriculum Design & Development and Content Authoring for the AVU Teacher Education Program.

- 25/07/03: Appointed by the former Faculty of Science, University of Nairobi as a **Reviewer** and successfully reviewed the **B.ED (SCIENCE) course SCH 103 for the DISTANCE LEARNING PROGRAMME** of the University of Nairobi.
- Dec., 2002: **Acquired a Gas Chromatograph and a High Performance Liquid Chromatograph worth KShs. 9 Million** for use by the Department of Chemistry through the **International Role of Community Research for Development (INCO-DEV) Grant** from the EU.
- July. 2001: Won a **Fulbright Senior Research Scholar Award** to conduct research at The Department of Chemistry & Geochemistry, Colorado School of Mines, USA for 9 months.
- Dec./97-1999: **Secretary** to the committee that successfully developed the four (4) year Bachelor of Science degree program in Industrial Chemistry in the Department of Chemistry, University of Nairobi.
- Jan. - Dec/97: **Secretary** to the committee that reformulated the Undergraduate and Graduate level courses for the Analytical Chemistry Division, Department of Chemistry, University of Nairobi.
- Dec./97 -1999: **Secretary** to a 5-member committee that developed the **Advanced Diploma in Analytical Techniques** program in the Department of Chemistry, University of Nairobi. The committee was chaired by Prof. S.O. Wandiga.

### ***Science:***

- Pioneered the development of **Thermal Field-Flow Fractionation (ThFFF)** technique for the retention and separation of particulate matter of environmental and industrial nature (See Publication #s. 10-14, 18-19, 21-22, 24-25).
- Published several refereed articles on **Thermal Field-Flow Fractionation (ThFFF)** in International reputable journals.

### **RESEARCH GRANTS AWARDED:**

- 2007 Jointly awarded **USD 50,000.00** Grant per Year for three (3) years by VicRes in support of a research project entitled **Investigating the Factors Affecting Levels of Omega-3 Polyunsaturated Fatty Acids (PUFA) in Commercial Fish Species in Lake Victoria**. Collaborating Institutions: Department of Chemistry, University of Nairobi (Kenya); Department of Biochemistry, University of Nairobi; and Department of Fisheries Science and Aquaculture, University of Dar-Es-Salaam (Tanzania).
- 2007: Jointly Awarded **USD 25,000.00** Grant by Trojan UV (and matched dollar-for-dollar by **University of Nairobi Enterprises and Services Limited (UNES)**) to help facilitate the development of a Business Plan for the Establishment of Water Quality Centre at the University of Nairobi.
- 2006: Jointly Awarded **USD 2,000.00** Grant by African Women in Science & Engineering (AWSE) in conjunction with United Nations Educational, Scientific and Cultural Organization (UNESCO) to organize a workshop to sensitize faculty members on the need

for "Mainstreaming HIV & AIDS in the Curricula of the School of Physical Sciences of the University of Nairobi.

- 2002: Jointly Awarded an **International Role of Community Research for Development (INCO-DEV) Research Grant** by The EU in support of a project entitled "*Pollution monitoring in the Nairobi river: Application of New and Robust Biosensor Technologies Adapted to Locally available Resources*". Collaborating Institutions: GSF - National Research Center for Environment and Health GmbH, Institute of Ecological Chemistry, Neuherberg; ICB- Institut für Chemo- und Biosensorik, Chemical and Biochemical Sensor Systems, Münster; School of Clinical and Laboratory Sciences, Newcastle Upon Tyne; University of Nairobi, Departments of Biochemistry & Chemistry, University of Nairobi; and Institute of Environment and Natural Resources, Kampala-Uganda; **Euros 560,000.00**
- April, 2001: Awarded an Agricultural Research Fund (ARF) grant by the Kenya Agricultural Research Institute (KARI) in support of a project entitled "*Towards an Improved System for the Selection and/or Production of High Quality Gum Arabic in Kenya*", **US\$ 30,000.00**
- June, 1998: Awarded the International Foundation for Science (IFS) Research Grant in support of a project entitled "Evaluating the Potential of Thermophilic Microorganisms of the Rift Valley Hot Springs in Bioremediation", **US\$ 12,000.00**
- April, 1997: Awarded a Third World Academy of Sciences (TWAS) Research Grant in support of a project entitled "Separation and Characterization of Polymeric and Particulate Matter by Thermal Field-Flow Fractionation", **US\$ 8,000.00**
- Feb., 1997: Awarded a Deans Committee Research Grant in support of a project entitled "Chemical Determination of Toxic Phenolic Compounds in Water and the Development of an Adsorbent System for the Treatment of Factory Effluents", University of Nairobi, Kenya, **KShs. 160,000.00.**

#### **UNDERGRADUATE RESEARCH PROJECTS SUPERVISED:**

1. D.L. Barasa, "Simultaneous Spectrophotometric Determination of Fe (III) and V (V) ions", (1996).
2. S. Munguti, "Effects of Cationic Surfactants on Sulphur (II) - Azide Reactions", (1996).
3. M.B. Wabuyele, "Evaluation of Iron-Enriched Calcium Carbonate as a Potential Adsorbent for Phenol in Water", (1997).
4. G.O. Masanta, "Characterization of Iron-Enriched Marble as an Adsorbent for Chlorophenol", (1997).
5. T.S. Muchangi, "Chemical Characterization of three (3) varieties of Chalk-Stone and Evaluation of their Potential Harmful Effects", (1997).
6. C.W. Wachira, "Evaluation of a Locally Available Polymineral Soft Stone (PMSS) as a Potential Filter of Phenols in Aqueous Solutions", (1998).
7. T.K. Karakach, "Potential Use of Thermophilic Bacteria in Heavy Metal Pollution Control", (1999).
8. C.O. Ongayi, "Evaluation of the Potential of Thermophilic Bacteria of the Rift Valley Hot Springs in Biodegradation of Toxic Organic Compounds", (1999).

9. K.G. Nyutu, "Kinetics of Perborate Bleaching Action in Liquid Detergent Formulations", (2000).
10. J.O. Maranga, "The Physico-Chemical Investigation of a Developer for Black and White Photography", (2000).
11. M.B. Kikechi, "Cationic Exchange Properties of a Locally Available Mineral", (2001).
12. R.L. Adhiambo, "Effect of Ethylenediamine tetraacetic acid (EDTA) on Cationic Exchange Properties of a Locally Available Micaceous Mineral", (2001).
13. D.O. Olum, "Removal of Methylene Blue Dye from an Aqueous Solution Using a Micaceous Mineral of Kenyan Origin", (2003).
14. F. Odeka, "Adsorption of Textile Dyes from Aqueous Solutions by a Biodegradable Material in Batch and Continuous Flow Modes of Operation", (2005).
15. S.L. Temba, "Adsorption Characteristics of Dyes from Aqueous Solution by a Natural Marine Plant (*Carteriospongia Foliascens*) and Oyster Nut (*Telfairia Pedata*)", (2006).
16. E.K. Okworo, "Testing the Efficacy of *Luffa Cylindrica* in Ink Removal from Aqueous Solutions", (2006).
17. S. Malimo, "Extraction and Analysis of Oil from Oyster Nut (*Telfairia Pedata*)", (2006).
18. V. Muinde, "Analysis of DDT and its Metabolites in Sediment Samples and Characterization of the Physico-chemical Parameters of Nairobi River Water", (2007).
19. Victor Ochieng-Jaoko, "A Study of *Calodendrum Capense* as an Alternative Fuel", (2008).

### **GRADUATE RESEARCH PROJECTS SUPERVISED**

#### **M.Sc. Students & Research Projects Successfully Supervised:**

1. Herbert Wanjala Kavunja, "Properties and Performance Testing of Biodiesel from *Jatropha Curcus* and its Blends", M.Sc. Research Thesis Successfully Defended and awaiting corrections, (January, 2010).
2. Elizabeth N. Ndunda, "Analysis of Polychlorinated Biphenyls (PCBs) in Sediments and Water from Nairobi River", M.Sc. Research Thesis Successfully Defended (November, 2009).
2. Timothy Muthaura Mugambi, "Removal of Textile Dyes from Aqueous Solutions using *Luffa Cylindrica* of Kenyan Origin: Kinetics and Equilibrium Sorption Studies", Thesis Successfully Defended (August, 2009).
3. Ndathe John Kairu, "A study of the Uptake of Selected Heavy Metal Ions and Trichloroethylene (TCE) by Sweet Potato Varieties in Kenya", M.Sc. Research Thesis Successfully Defended (March, 2009).
4. Wambu Enos Wamalwa, "Removal of Copper ions from Aqueous Solutions by Regenerated Spent Bleaching Earth (SBE)", M.Sc. Research Thesis Successfully Defended, (March, 2009).
5. Evans Ochieng Omotto, "Evaluation of Nairobi Wastewater Treatment Efficiency at Dandora Sewerage Treatment Works and Possible Applications of the Effluent", M.Sc. Research Thesis Successfully Defended (February, 2007).

6. Patrick Musyoki Shem, "Release Kinetics of a Synthetic Tsetse Allomone based on Waterbuck Odour from a Tygon Silicon Dispenser", M.Sc. Research Thesis Successfully Defended, (June, 2006).
7. Wilson Gichuhi Kamundia, "Influence of selected co-solutes on Cu(II) ion Removal from Aqueous Solutions using a Micaceous Mineral of Kenyan Origin", Research Thesis Successfully Defended (May, 2005).
8. S.M. Attahiru, "Metal Ion Sorption by a Locally Available Natural Polymineral Adsorbent", M.Sc. Research Thesis Successfully Defended (October, 2003).
9. P.M. Guto, "Mediated Dehalogenation of Organohalides at both Rotating (Glassy Carbon and Pyrolytic Graphite) Disk Electrodes and [PSS/metMb] Films in Microemulsions", M.Sc. Research Thesis Successfully defended (June, 2003).
10. D.N. Wachira, "Sorption and Detection of Phenolic Compounds by Rice Husk Ash", M.Sc. Thesis successfully defended (April 2001 and graduated in December 2001).
11. A.F. Otieno, "Evaluating the Potential of Thermophilic Bacteria of the Rift Valley Hot Springs in Water Pollution Control", M.Sc. Research (2000).
12. S.M. Munguti, "Separation and Characterization of Polymeric and Particulate Matter by Thermal Field-Flow Fractionation", M.Sc. Thesis successfully defended (December, 2000 and graduated in December 2001).
13. B.M. Wamalwa; "Studies on Vernonia Oil as a Potential Fatty Raw Material for Soap Manufacture." Thesis Successfully Defended (July, 1998).

**Continuing M.Sc. Research Students & Research Projects:**

14. Caroline Agoi, "Dye Adsorption Characteristics by Two Unmodified Lignocellulosic Biomass Materials (*Telfairia Pedata* and *Luffa Cylindrica*) in Batch and Fixed-Bed Systems", M.Sc. Research Thesis Submitted for Examination, (January, 2010).
15. Dorice Soita Situma, "Analysis of Polycyclic Aromatic Hydrocarbons in Ambient Air and Soils at Selected Sites within Nairobi City", M.Sc. Research Thesis Submitted for Examination, (January, 2010).
16. Nicholas Mwenda Jacob, "Risk Assessment of Pesticide Residues in Cow's Milk from Agricultural Areas in Nairobi West District, Kenya", M.Sc. Draft Thesis Submitted for Comments. Continuing student (Registered 2008).
17. Robert Koigi, "Assessment of Spatial and Temporal Trends in Pesticide Residues and Nutrients in Water, Soil, and Sediments from Nairobi River", M.Sc. Research, Continuing student (Registered 2009).
18. Edna Masenge, "Assessment of Total Petroleum Hydrocarbon, Oil, and Grease in Sediments and Waters in Ngong and Mathare Rivers", M.Sc. Research, Continuing student (2009).
19. Florence K. Gitari, "Assessment of Polychlorinated Biphenyls (PCBs) in Sediments and Water from Ngong and Mathare Rivers", Continuing student (2009).
20. Amboga Davis Anzenze, "Biosorption of Heavy Metals from Water using Water Hyacinth: Adsorption Properties and Technological Assessment", Continuing student (2009).



21. Wycliffe Chisutia Wanyonyi, "Biosorption of Organic Dyes from Aqueous Solution using Water Hyacinth (*Eichornia Crassipes*) from Lake Victoria", M.Sc. Research, Continuing student (2009).
22. Wanyama Nandokha George, "Residues in Water and Sediments from Mutoine, Nairobi and Kengemi Dams", M.Sc. Research, Continuing student (2009).

**Ph. D. Students Successfully Supervised to Completion:**

1. Peter N. Muigai, "Eutrophication of Nairobi Dam and its Implications on the Surrounding Environment", Ph.D. Thesis Successfully Defended and Graduated, 2008.
2. J.K. Lelon, "Studies on Trace Elements Uptake by Three (3) Acacia Species Under Arid and Semi-arid Conditions", Ph.D. Thesis Successfully Defended and Graduated, 2008.

**Continuing Ph. D. Research Students & Research Projects:**

3. A.W. Karuri, "Landuse Types and Water Pollution: A Case Study of Thika River", Ph.D. Research Thesis Write-up in advanced stages of completion (2010).
4. Vincent O. Madadi, "Studies of Pesticides and Macronutrients Cyclization and Interaction Dynamics in Lake Victoria and Nairobi River Ecosystems", Enrolled as Ph.D. Thesis Write-up underway (2009).
5. J. Wabomba, "Single- and Multi-component Metal Ion Sorption on a Micaceous Mineral of Kenyan Origin: Kinetics and Equilibrium Studies", Enrolled as Ph.D. Research Student in 2004 and Research work in advanced stage of completion.
6. Carolyn O. Wasonga, "Effects of Heavy Metals on Omega-3 Polyunsaturated Fatty Acids (PUFA) in Commercial Fish Species in Lake Victoria", Proposal Submitted and Registered as Ph.D. Research Student in May 20, 2008.
7. Immaculate Achieng Odero, "Evaluating the Efficacy of Selected Lignocellulosic Materials of Kenyan Origin in the Removal of Textile Dyes and Inks from Aqueous Industrial Effluents: Kinetics and Equilibrium Studies", Proposal Submitted and Registered as Ph.D. Research Student in 2009.
8. Faridah Hussein Were, "Assessment of Levels of Selected Heavy Metals and their Effects on the Health of Industrial Workers in Nairobi and Athi River, Kenya", Proposal Submitted and Registered as Ph.D. Research Student in 2009.

**PUBLICATIONS IN REFEREED JOURNALS (2004 – To date)**

1. D.O. Ogoyi, Chacha Mwita, E.K. Nguu, C.O. Wasonga, and Paul M. Shiundu; "Effects of Heavy Metal Pollution on Microalgae Richness and Diversity in Lake Victoria"; Lake Victoria Research Initiative (VICRES) Proceedings: VicRes Pollution and Heavy Metal Cluster Workshop 2<sup>nd</sup> ó 4<sup>th</sup> April 2009, Bujumbura, Burundi; pp 193 ó 210, (2009).
2. Patrick M. Shem, **Paul M. Shiundu**, Nicholas K. Gikonyo, Ahmed Hasssanali and Rajinder K. Saini, "Release Kinetics of a Synthetic Tsetse Allomone Derived from Waterbuck Odour from a Tygon silicon dispenser under Laboratory and Semifield conditions"; *American-Eurasian J. Agric. & Environ. Sci.*, **6(6)**, 625-636, (2009).

3. Enos W. Wambu, Gerald K. Muthakia, **Paul M. Shiundu** and Joseph K. wa-Thiongø, "Kinetics of Copper Desorption from Regenerated Spent Bleaching Earth"; *American-Eurasian Journal of Scientific Research*, **4(4)**, 317-323, (2009).
4. Enos W. Wambu, Gerald K. Muthakia, Joseph K. wa-Thiongø and **Paul M. Shiundu**, "Regeneration of Spent Bleaching Earth and its Adsorption of Copper (II) ions from Aqueous Solutions"; *Applied Clay Science*, **46**, 176-180, (2009).
5. John M. Onyari, Francis Mulaa, Joshua Muia, **Paul M. Shiundu**, "Biodegradability of Poly (lactic acid), Preparation and Characterization of PLA/Gum Arabic Blends"; *Journal of Polymers and the Environment*, **16 (3)**, 205 ó 212 (2008).
6. P.M. Kramer, C.M. Weber, E. Kremmer, C. Rauber, D. Martens, S. Forster, L.H. Stanker, P. Rauch, **P.M. Shiundu** and F.J. Mulaa, "Optical Immunosensor and ELISA for the Analysis of Pyrethroids and DDT in Environmental Samples", In *Rational Environmental Management of Agrochemicals: Risk Assessment, Monitoring, and Remedial Action*; Ivan R. Kennedy, Keith Solomon, Shirley Gee, Angus Crossman and Shuo Wang, Editors; American Chemical Society (ACS) Symposium Book Chapter; American Chemical Society: Washington, D.C., (2007).
7. Benson Munyali Wamalwa; Guanshan Zhao, Makiko Sakka; **Paul Mwanza Shiundu**; Tetsuya Kimura; and Kazuo Sakka, "High Level Heterologous Expression of *Bacillus halodurans* Putative Xylanase *Xyn11A* (BH0899) in *Kluyveromyces lactis*", *Biosci. Biotechnol. Biochem.*, **7**, 60477-1-6 (2007).
8. Benson Munyali Wamalwa; Makiko Sakka; **Paul Mwanza Shiundu**; Kunio Ohmiya; Tetsuya Kimura; and Kazuo Sakka, "Essentiality of a Newly Identified Carbohydrate-Binding Module for the Function of CelB (BH0603) from the Alkaliphilic Bacterium *Bacillus halodurans*", *Appl. Environ. Microbiol.*, **72 (10)**, 6851-6853 (2006).
9. Wamalwa, B.M., M. Sakka, **P.M. Shiundu**, T. Kimura, K. Ohmiya, and K. Sakka, "The C-terminal "X" domain of the putative *celB* gene from alkaliphilic *Bacillus halodurans* C-125 is a new crystalline cellulose binding molecule", *J. Appl. Glycoscience*, **52 Suppl.**, 49-51 (2005).
10. **P.M. Shiundu** and K.R. Williams, In *Particle Sizing and Characterization*; Provder, T. and Texter, J., Eds.; American Chemical Society (ACS) Symposium Series 881; American Chemical Society: Washington, D.C., **2004; Vol. 881, Ch. 12.**

#### **PUBLICATIONS IN REFEREED JOURNALS (1987 – 2003)**

11. **P.M. Shiundu**, P. Stephen Williams and J.C. Giddings, "Magnitude and Direction of Thermal Diffusion of Colloidal Particles Measured by Thermal Field-Flow Fractionation", *J. Colloid and Interface Sci.*, **266(2)**, 366-376 (2003).
12. S.M. Attahiru, **P.M. Shiundu**, J.M. Onyari and E.M. Mathu, "Removal of Cu (II) from an Aqueous Solution using a Micaceous Mineral of Kenyan Origin", *Adsorption Science & Technology*, **21(3)**, 269-283 (2003).
13. **P.M. Shiundu**, S.M. Munguti, and S.K.R. Williams, "Practical Implications of Ionic Strength Effects on Colloidal Particle Retention in Thermal Field-Flow Fractionation", *J. Chromatogr. A.*, **984**, 67-79 (2003).

14. **P.M. Shiundu**, S.M. Munguti, and S.K.R. Williams, " Retention Behavior of Metal Particle Dispersions in Aqueous and Nonaqueous Carriers in Thermal Field-Flow Fractionation.", *J. Chromatogr. A*, **983**, 163-176 (2003).
15. D.N. Mbui, **P.M. Shiundu**, R.M. Ndonge and G.N. Kamau, "Sorption and Detection of Phenolic Compounds by Rice Husk Ash of Kenyan Origin " *J. Environ. Monit.*, **4**, 978-984 (2002).
16. **P.M. Shiundu** and Kim R. Williams, "Thermal Field-Flow Fractionation for Particle Analysis: Opportunities and Challenges", *Polym. Mater. Sci. Eng.*, **87**, 342 (2002).
17. **P.M. Shiundu**, S.M. Munguti and B.M. Wamalwa, "Factors Affecting Particle Retention in Thermal Field-Flow Fractionation.", *Bull. Chem. Soc. Ethiop.*, **16(1)**, 91-101 (2002).
18. B.M. Wamalwa, **P.M. Shiundu**, and G.N. Kamau, "Thermal Stability Studies on *Vernonia Galamensis* Seed Oil", *Bull. Chem. Soc. Ethiop.*, **14(2)**, 161-167 (2000).
19. B.M. Wamalwa, **P.M. Shiundu**, and G.N. Kamau, "Fuel Value of Refined *Vernonia Galamensis* Seed Oil", *Int. J. BioChemiPhysics*, **6&7**, 33 (1998).
20. **P.M. Shiundu**, "Field-Flow Fractionation: Theory and Practice", Proceedings of the 2nd Theoretical Chemistry Workshop in Africa held on 26th-30th August, 1996, Nairobi, Kenya.
21. **P.M. Shiundu**, E.E. Remsen, and J.C. Giddings, "Isolation and Characterization of Polymeric and Particulates of Acrylonitrile-Butadiene-Styrene (ABS) Plastics by Thermal FFF", *J. Appl. Polym. Science.*, **60**, 1695-1707, (1996).
22. J.C. Giddings, **P.M. Shiundu**, and S.N. Semenov, "Thermophoresis of Metal Particles in a Liquid.", *J. Colloid and Interface Science*, **176**, 454-458, (1995).
23. S.K. Ratanathanawongs, **P.M. Shiundu**, and J.C. Giddings, "Size and Composition Studies of Core-Shell Latexes Using Flow and Thermal Field-Flow Fractionation.", *Colloids Surfaces A: Physicochemical and Engineering Aspects.*, **105**, 243-250, (1995).
24. **P.M. Shiundu** and J.C. Giddings, "Influence of Bulk and Surface Composition on the Retention of Colloidal Particles in Thermal Field-Flow Fractionation.", *J. Chromatography A.*, **715**, 117-126, (1995).
25. **P.M. Shiundu**, G. Liu, and J.C. Giddings, "Separation of Particles in Nonaqueous Suspensions by Thermal Field-Flow Fractionation.", *Anal. Chem.*, **67**, 2705-2713, (1995).
26. M.D. Kester, **P.M. Shiundu**, and A.P. Wade, "Spectrophotometric Method for Determination of Sulfide with Iron(III) and Nitrilotriacetic Acid by Flow Injection.", *Talanta*, **39(3)**, 299-312, (1992).
27. **P.M. Shiundu** and A.P. Wade, "Development of Catalytic Photometric Flow Injection Methods for Determination of Selenium.", *Anal. Chem.*, **63**, 692-699, (1991).
28. **P.M. Shiundu** and A.P. Wade, "Versatile IEEE-488 Data Acquisition and Control Routines for Diode Array Spectrophotometer.", *J. Automatic Chem.*, **13(3)**, 83-92, (1991).
29. **P.M. Shiundu**, P.D. Wentzell, and A.P. Wade, "Automated Exploration and Exploitation of Flow Injection Response Surfaces.", *Anal.Chim.Acta*, **237**, 361-379, (1990).
30. **P.M. Shiundu**, A.P. Wade, and S.B. Jonnalagadda, "Spectrophotometric Determination of Peroxydisulphate With o-Dianisidine by Flow Injection.", *Can.J.Chem.*, **68**, 1750 (1990).

31. **P.M. Shiundu**, P.D. Wentzell, and A.P. Wade, "Spectrophotometric Determination of Palladium(II) ions with Sulphochlorophenolazorhodanine by Flow Injection.", *Talanta*, **37**, 329, (1990).
32. **P.M. Shiundu**, P.M. Wentzell, M.J. Hatton, and A.P. Wade, "Computer-Controlled Apparatus for Automated Development of Continuous Flow Methods.", *J. Automatic Chem.*, **11(5)**, 227-235, (1989).
33. **P.M. Shiundu** and S.B. Jonnalagadda, "A Novel Spectrophotometric Method for the Determination of Peroxydisulphate ions Using o-Dianisidine-S<sub>2</sub>O<sub>8</sub><sup>2-</sup>-Cu(II) Indicator Reaction.", *Revue Roumaine de Chemie*, **33(6)**, 611, (1988).
34. A.B. Callear and **P.M. Shiundu**, "Temperature dependence of the Hg6s6p (<sup>3</sup>P<sub>1</sub>→<sup>3</sup>P<sub>0</sub>) Transition Induced by Nitrogen", *Chemical Physics Letters*, **136**, 342, (1987).

### **MANUSCRIPTS SUBMITTED FOR PUBLICATION IN REFEREED JOURNALS**

35. **Paul M. Shiundu** and Wilson G. Kamundia "Adsorption-Desorption Characteristics of Cu (II) ions using a micaceous mineral in the presence of Selected Co-solutes", *Manuscript submitted to Adsorption Science and Technology Journal, October, 2009.*
36. **Paul M. Shiundu** and Wilson G. Kamundia "Adsorption of Cu<sup>2+</sup> ions onto a Micaceous Mineral in the presence of Selected Chelating Agents and a Surfactant: pH, Ionic Strength and Equilibrium Sorption Studies", *Manuscript submitted to Applied Clay Science, October, 2009.*

### **MANUSCRIPTS IN PREPERATION FOR SUBMISSION FOR PUBLICATION IN REFEREED JOURNALS**

37. **Paul M. Shiundu** and Wilson G. Kamundia "Influence of EDTA and other Selected Co-solutes on Batch Cu (II) Removal from Aqueous Solutions Using a Micaceous Mineral of Kenyan Origin", *Manuscript in Preparation.*
38. Madadi, O.V., Wandiga, S.O., Njogu, J.M., Mutie, T., Mavuti, K.M., Jumba, I.O., **Shiundu, P.M.**, and Harper, D.M., "Occurrence and Distribution of Organochlorine Pesticides in Lake Naivasha Catchment",
39. Patrick M. Shem, **Paul M. Shiundu**, Nicholas K. Gikonyo, Ahmed Hasssanali and Rajinder K. Saini, "Quantification of release kinetics of a synthetic tsetse allomone derived from waterbuck odour by GC analysis", *Manuscript in Preparation.*

### **BOOKS/MONOGRAPHS/e-Learning Modules:**

1. P.M. Shiundu and D.W. Mbui; Authored a Teaching Module for **Open and Distance Learning (ODL)** Course titled "Advanced Chemical Kinetics and Electrochemistry" (2008).
2. P.M. Shiundu; Author of an e-Learning Module in Chemistry entitled "Volumetric Chemical Analysis" under the Chemistry Curriculum Design & Development and Content Authoring for the African Virtual University (AVU) Teacher Education Program (2007). Edited by Dr. Buchweishaija.
3. P.M. Shiundu and D.M. Yusuf; Author of an e-Learning Module in Chemistry entitled "Introduction to Chemistry" under the Chemistry Curriculum Design & Development and

Content Authoring for the African Virtual University (AVU) Teacher Education Program (2007). Edited by Dr. George Mhehe.

4. P.M. Shiundu and S.P. Karuu; Authored a Teaching Module for **Open and Distance Learning (ODL)** Course titled *Introduction to Chemical Kinetics and Electrochemistry* for the University of Nairobi, Kenya. Reviewed by Prof. Duke O. Orata and Edited by Mr. J.O. Odumbe (Director, Centre for Open & Distance Learning, University of Nairobi) (2004).

### **TECHNICAL REPORTS:**

- June/07: **Integrating HIV & AIDS Information in the Teaching Curricula**. A Report submitted to United Nations Educational, Scientific and Cultural Organization (UNESCO) and African Women in Science & Engineering (AWSE)
- Jan., 2006: **"Status of Science Training Programmes in Kenyan Public Universities"**. A Report Submitted to the Public Universities Inspection Board (PUIB).
- Sept./03: **"Bacterial and Physico-chemical Soil Survey of Mombasa-Nairobi (Line 1) Pipeline"**. A Report submitted to Kenya Pipeline Company Limited.
- Dec./02: **"Waste Abatement Technology Options for Bata Shoe Company"**. A report submitted to Bata Shoe Company, Limuru-Kenya".
- June/01: **"Air Quality Assessment at Bata Shoe Company and its Environs"**. A Report submitted to Bata Shoe Company, Limuru- Kenya.

### **PRESENTATIONS AT CONFERENCES, SYMPOSIA & WORKSHOPS ATTENDED:**

1. P.M. Shiundu\* and A.B. Callear: **Mechanism(s) of  $\text{Hg } 6s6p(^3P_1) \rightarrow \text{Hg } 6s6p(^3P_0)$  Transition Induced by Nitrogen**. Seminar, Chemistry Department, University of British Columbia, November 1987.
2. P.M. Shiundu\*, P.D. Wentzell, and A.P. Wade: **Automated Methods Development for Flow Injection Analysis: Some Case Studies**. Federation of Analytical Chemistry and Spectroscopy Society (FACSS) XV, Boston, November 1988.
3. A.P. Wade\*, P.M. Shiundu. and P.D. Wentzell: **Automated Development of FIA by Adaptive Control**. Flow Analysis IV, Las Vegas, April 17-20th, 1988.
4. P.M. Shiundu, A.P. Wade, P.D. Wentzell, and J.A. Horner: **New Programmable Hardware in Automated Flow Injection Analysis**. Federation of Analytical Chemistry and Spectroscopy Society (FACSS) XV, Boston, November 1988.
5. P.M. Shiundu\*, P.D. Wentzell, and A.P. Wade: **Spectrophotometric Determination of Peroxydisulphate With Sulphochlorophenolazorhadanine by Flow Injection**. Federation of Analytical Chemistry and Spectroscopy Society (FACSS) XVI, Chicago, October 1989.
6. P.M. Shiundu\* and A.P. Wade: **Spectrophotometric Determination of Peroxydisulphate With o-Dianisidine by Flow Injection**. Winter Conference on Flow Analysis, Florida, January 3-5th, 1990.
7. P.M. Shiundu\* and A.P. Wade: **Catalytic Photometric Determination of Selenium by Flow Injection Analysis**. Federation of Analytical Chemistry and Spectroscopy Society (FACSS) XVII, Cleveland, October 1990.

8. A.P. Wade\*, P.M. Shiundu and P.D. Wentzell: "Automated Exploration and Exploitation of Flow Injection Response Surfaces". Federation of Analytical Chemistry and Spectroscopy Society (FACSS) XVII, Cleveland, October 1990.
9. P.M. Shiundu\*, G. Liu, and J.C. Giddings: "Factors Affecting Particle Retention in Thermal Field-Flow Fractionation". The Third International Symposium on Field-Flow Fractionation, Salt Lake City, Utah, October 1992.
10. P.M. Shiundu\*, M.N. Myers, S.K. Ratanathanawongs, and J.C. Giddings: "Recent Advances in Particle Characterization by Field-Flow Fractionation". 24th Annual Meeting of the Fine Particle Society, Chicago 1993.
11. P.M. Shiundu\*: "Field-Flow Fractionation: Theory and Practice". The 2nd Theoretical Chemistry Workshop in Africa, Nairobi, Kenya, August 26th-30th, 1996.
12. P.M. Shiundu\* and S.M. Munguti: "Thermal Field-Flow Fractionation: Theory and Practice in the Separation and Characterization of Synthetic Polymers and Particulates". The 3<sup>rd</sup> Kenya Chemical Society International Conference, Nairobi, Kenya, 16<sup>th</sup>-20<sup>th</sup> August, 1999.
13. S.M. Munguti\*, and P.M. Shiundu: "Effects of Ionic Strength of Carrier on Particle Retention in Thermal Field-Flow Fractionation". The 3<sup>rd</sup> Kenya Chemical Society International Conference, Nairobi, Kenya, 16<sup>th</sup>-20<sup>th</sup> August, 1999.
14. P.M. Shiundu\* and B. Anyango\*: "Institutional Arrangements Towards Biotechnology Policy Making in Kenya". *Paper prepared and presented for Biotechnology and Public Policy Training Course at The African Centre for Technology Studies (ACTS)*, Nairobi, Kenya, Sept. 30<sup>th</sup> - October 29<sup>th</sup>, 1999.
15. P.M. Shiundu, F. Mulaa\* and E.R.B. Moore: "Effects of Metal Ions and Phenolic Compounds on Thermophilic Bacteria isolated from Lake Bogoria - Kenya". *Poster presentation at The Third International Congress on Extremophiles, Humburg-Harburg/ Germany, 3<sup>rd</sup> - 7<sup>th</sup> September, 2000.*
16. P.M. Shiundu, "Basic Principles and Applications of Chromatography". **Lecture Paper Presented** at the Natural Products Research Network for Eastern and Central Africa Kenya Branch (NAPREKA-K). Pre-Symposium Workshop held at the Department of Chemistry, University of Nairobi; Nairobi-Kenya, 22<sup>nd</sup> - 24<sup>th</sup> August, 2001.
17. P.M. Shiundu: "Opportunities and Challenges of Thermal Field-Flow Fractionation in Particle Characterization". *Paper presented at The Department of Chemistry & Geochemistry, Coolbaugh Hall, Colorado School of Mines, Golden Colorado, USA, April 16<sup>th</sup>, 2002.*
18. P.M. Shiundu\* and Kim R. Williams: "Thermal Field-Flow Fractionation for Particle Surface Composition Analysis". **Paper presented** at the 44th Rocky Mountain Conference on Analytical Chemistry, Hyatt Regency Denver, Denver, Colorado, (USA), July 28-August 1, 2002.
19. P.M. Shiundu\* and Kim R. Williams: "Thermal Field-Flow Fractionation for Particle Analysis: Opportunities and Challenges". **Paper presented** at the 224<sup>th</sup> American Chemical Society (ACS) National Meeting; Polymeric Materials Science and Engineering Division, Boston, Massachusetts, August 18-22, 2002.
20. Reviewed Course SCH 103 at a B.ED. (SCIENCE) Editors/Reviewers Workshop for the Distance Learning Programme at Garden Hotel, Machakos, July 25-28, 2003.

21. Invited to attend The University of Nairobi Tutors Workshop at the Faculty of Science Board Room, Chiromo Campus on August 7<sup>th</sup>, 2003.
22. Attended "The African Virtual University (AVU) Teacher Education Curriculum Design & Development Workshop", The Hilton Hotel, Nairobi (Kenya), October 24<sup>th</sup> to 29<sup>th</sup>, 2005.
23. Invited by The National Environment Management Authority (NEMA) to attend a "National Workshop on Country Priorities Targeting Global Environment Facility (GEF) Funding for the Plan Period 2006-2011", 17<sup>th</sup> August, 2006.
24. Invited to attend "The African Virtual University (AVU) Teacher Education Content Authoring Workshop", The Nairobi Safari Club Hotel, Nairobi (Kenya), 21<sup>st</sup> August to 2<sup>nd</sup> September, 2006.
25. Madadi, V.O., S.O. Wandiga, and P.M. Shiundu. "Assessment of Sustainability of Agricultural Practices in Kenyan Catchment of Lake Victoria". *Paper presented* at the XII CHEMRAWN International Conference on The Role of Chemistry in Sustainable Agriculture and Human Wellbeing in Africa. Stellenbosch University, South Africa, December 2<sup>nd</sup> to 5<sup>th</sup>, 2007.
26. Attended the Lake Victoria Research Initiative (VicRes) Pollution and Heavy Metal Cluster Workshop; Club la Tanganyika, Bujumbura, Burundi, April 2<sup>nd</sup> to 4<sup>th</sup>, 2009.
27. Attended the First Coordination Meeting and the 6<sup>th</sup> African Regional Conference on Research Reactors in Abuja, Nigeria, November 2<sup>nd</sup> to 6<sup>th</sup>, 2009.
28. Attended the 3<sup>rd</sup> Conference of Vice-Chancellors and Deans of Science, Engineering and Technology (COVIDSET 2009) in Kampala, Uganda, November 23 to 25, 2009.

### **PROFESSIONAL AFFILIATIONS:**

- Sept./06- 09: Invited Member of the Editorial Advisory Board of the Journal CLEAN to Soil, Air, Water (Journal of Sustainability and Environmental Safety).
- Feb. 05-Now: Member, Kenya National Academy of Sciences (KNAS).
- 2003 - Now: Nominated Member, Society for Applied Spectroscopy (Identification Number: 98010966).
- 2002 - Now: Member, The American Chemical Society (ACS) - Identification Number: 2327005.
- 1998-2002: Secretary, Editorial Sub-committee of the Journal of the Kenya Chemical Society (JOKCS).
- 1996-2002: Member, Editorial Board of the Journal of the Kenya Chemical Society (JOKCS).
- 1995 - Now: Member, Kenya Chemical Society (KCS).

### **PROFESSIONAL EXPERIENCE:**

- May 4, 2009: To attend an Eleven (11) day PART I "International Deans Course Africa 2009/10" in Osnabruck and Berlin Germany (May 4 to 14, 2009). This is an intensive training course which is part of the Dialogue on Innovative Higher Education Strategies (DIES) programme and jointly coordinated by DAAD

- and HRK (German Rectorsø Conference). Issues to be discussed include; Faculty management, higher education governance, financial management, change management, quality assurance and leadership.
- Feb. 25, 2008: Attended a Two (2) weeksø Management Development Training Workshop at Ghana Institute of Management and Public Administration (GIMPA), Accra, Ghana (Feb. 25 ó March 08, 2008).
- May 28, 2007: Attended a one day Training Workshop on **Public Procurement** at the Kenya College of Accountancy, Ruaraka, Nairobi óKenya.
- May 21, 2007: Attended a half-day **Senior University of Nairobi Management Rapid Results Initiative Brief** on Rapid Results Initiative and the Role of each member of the University Community during the 100 days.
- May 3, 2007: Attended a **Senior University of Nairobi Management Leadership Orientation Training on Rapid Results Approach** at The Utalii College, Ruaraka, Nairobi-Kenya.
- April 4-5, 2007: Attended a **Senior University of Nairobi Management Seminar on Results-Based Management** at The Utalii College, Ruaraka, Nairobi-Kenya.
- June/July 2004: Attended a three-weeks training course: øAnalytical Skills Development Course 2004ö organized and sponsored by **The Organization for the Prohibition of Chemical Weapons** (OPCW) at The Hague, Netherlands.
- Feb./03-Sept./03: Consultant on a "**Bacterial and Physico-Chemical Soil Survey of the Mombasa-Nairobi (Line 1) Pipeline**" Project commissioned by Rockland Kenya Limited for Kenya Pipeline Company Limited.
- June/00-Dec./01: Devised and Evaluated Waste Abatement Technologies to effectively deal with Waste at Bata Shoe Company.
- October, 1999: Successfully completed a one-month training course sponsored by The African Centre for Technology Studies and the East African Regional Programme and Research Network for Biotechnology, Biosafety and Biotechnology Policy Development (BIO-EARN) in øBiotechnology and Public Policyö, at The African Centre for Technology Studies (ACTS), Gigiri, NAIROBI ó Kenya.
- Jan. /95 - Now: Associate Principal Consultant, **MICAS LIMITED**; Environmental Systems Design; Pollution Monitoring and Control; Environmental Impact Assessment & Environmental Audits; Waste Management.
- Jan./95 - Now: Taught Undergraduate and Postgraduate courses in the Chemistry Department, University of Nairobi-Kenya. Courses taught include: Introduction to Chemical Kinetics and Electrochemistry (SCH 204); Advanced Chemical Kinetics and Electrochemistry (SCH 403); Advanced Chemical Kinetics and Electrochemistry for Industrial Chemistry students (SCI 403); Nuclear and Radiation Chemistry (SCH 407); Advanced Analytical Chemistry (SCH 501); and Water Chemistry (SCH 522).
- Jan./95 - Now: In charge of four (4) undergraduate physical chemistry laboratory experiments (i.e., courses SCH 203, 204 and 303) at the Department of Chemistry, University of Nairobi, Kenya.



- 1993 - 1994: Taught selected topics in a **Unified Separation Science** course to graduate students for two semesters, at the Department of Chemistry, University of Utah, USA, on behalf of Prof. J.C. Giddings.
- June, 1991: Completed a one month course in **Laboratory Chemical Safety**, Department of Occupational Health and Safety, University of British Columbia (UBC), Canada..
- Oct. 1990: Completed a one week FACSS XVII workshop on **The Art of Sample Preparation**, Cleveland Ohio, USA.
- 1987-May/91: Graduate Research and Teaching Assistant, Department of Chemistry, University of British Columbia, Canada.
- Jan./87 - July/87: Graduate Teaching Assistant, University of Cambridge, UK.

### **EXPERTISE AND RESEARCH INTERESTS:**

- Environmental Science Technologies including environmental pollution monitoring and risk assessment and control; Development of novel, affordable, and environmentally friendly techniques for the removal/destruction of dissolved organic/inorganic pollutants in water and wastewater systems; and Use of selected aquatic plants as biological indicators for heavy metal pollution.
- Exploration and Exploitation of Kenyan-Based Minerals and Ligno-Cellulosic Materials in wastewater pollution control strategies.
- Analysis of Pesticides (and/or their metabolites) and other Persistent Organic Pollutants (POPs) in water, sediments, plant and particulate matter.
- Environmental Impact Assessment; Environmental Audits; Environmental Management tools.
- Study of micro-organisms from unique ecosystems (specifically, thermophilic bacteria) as agents for pollution control and production of novel biomaterials.
- Biotechnology and Public Policy Matters.
- Separation Science Technologies, specifically Field Flow Fractionation (FFF) techniques for the separation and characterization of macromolecular, colloidal, and particulate materials.
- Development and testing of Analytical Methods for Analysis of Organic and Inorganic Chemicals of Agricultural, Industrial, and Clinical Origin.
- Computer-controlled Instrumentation and Data Acquisition and Analysis: automated methods development in continuous flow analysis.
- Flow Injection Analysis (FIA) - merging zones, flow reversals, interference and kinetic studies using gradients.
- Chemometrics - Multivariate methods for enhanced chemical analysis, experimental conditions optimization.
- Chemical Kinetics - solution and gas phase chemical reaction kinetics; time resolved studies on molecular attachment to excited atoms.

**Department, Faculty/School, College and University of Nairobi Responsibilities:**

- Feb. 2010: Appointed as **Member** of the College Corruption Prevention Committee-College of Biological and Physical Sciences by the Vice Chancellor, University of Nairobi.
- May 2009: Appointed **Supervisor** of the Student Organization of Nairobi University (SONU) Elections by the Vice Chancellor, University of Nairobi to oversee the student electioneering exercise.
- Jan. 2008: Appointed **Chairman** of the College of Biological & Physical Sciences **“Rapid Response Sub-Committee”** to coordinate support for students and staff directly and indirectly affected by the events following the post poll violence of December 2007.
- Oct. 2007: Appointed **Chairman** of the College of Biological & Physical Sciences Committee on **“Recognition of Outstanding Staff in the College”**.
- July 2007: Appointed Member of the Dean’s Sub-Committee on **“Cheating in and Re-marking of University Examinations”**. Report Submitted in September, 2008.
- July 2007: Appointed Member of the Dean’s Sub-Committee to Develop **“Policy on Academic Integrity”** for the University of Nairobi. Report Submitted in September, 2008.
- July 2007: Appointed **Chairman** of the College of Biological & Physical Sciences **“International Organization of Standards (ISO) Development Committee”** of the University of Nairobi to develop the ISO Quality Management System functional procedures, Work Instructions and Records in CBPS by the Deputy Vice-Chancellor (A&F).
- June 2007: Appointed Member of the **Senate Sub-Committee (The Kibwage Senate Sub-Committee) to “Review Admission Criteria”** for University of Nairobi Academic Programmes.
- April 2007: Appointed Member of the College of Biological & Physical Sciences **“College Procurement Committee”** by the Vice-Chancellor, University of Nairobi-Kenya.
- 2007 - Now: Member of **SENATE** of the University of Nairobi, Kenya.
- 2007 - Now: Member of the **Dean’s Committee**, University of Nairobi, Kenya.
- June 2006: Appointed as **Chairman of a Technical Evaluation Committee** for the Purchase of Equipments for the Centre for Biotechnology and Bioinformatics (CEBIB) of the College of Biological and Physical Sciences (CBPS) by the Vice-Chancellor, University of Nairobi.
- 10/2/2006: Appointed as **Chairman of a Technical Evaluation Committee** for the Purchase of Equipments for Molecular Biology and Biotechnology Laboratory Project in the Department of Biochemistry by the Vice-Chancellor, University of Nairobi.
- 12/01/2006: Nominated by the College of Biological & Physical Sciences to represent the College at a **University of Nairobi Enterprises and Services Limited (UNES) 2-Day Retreat** for University Academic Staff members to discuss the processes involved in the preparation of feasible and viable business plans, expressions of interest and consultancy proposals.

- Dec., 2005: Nominated as **Member of the CBPS's Research Policy Working Group** by the College of Biological & Physical Sciences (CBPS) to discuss Key Research Policy Issues; Drivers and Impediments to Growth of Research Activity; and Interventions to Jumpstart Research Activities and make recommendations to the University's Committee on Research Policy.
- 2005 - Now: Representative of the College of Biological & Physical Sciences (CBPS) to the **University of Nairobi Press Editorial Committee**.
- May, 2005: Department of Chemistry Representative to the **Biotechnology Committee** charged with the responsibility of Developing a Proposal for the Establishment of the **Centre for Biotechnology & Bioinformatics (CEBIB)** for the College of Biological and Physical Sciences, University of Nairobi.
- May, 2005: Member of the Committee charged with the responsibility of developing the **Strategic Plan for the Centre for Biotechnology & Bioinformatics**.
- 2003 - Now: Member of the **College of Biological & Physical Sciences (CBPS) Academic Board**.
- 25/07/03: Appointed by the Faculty of Science, Chiromo campus as a **Reviewer** and successfully reviewed the **B.ED (SCIENCE) course SCH 103 for the DISTANCE LEARNING PROGRAMME** of the University of Nairobi.
- 1996 - 2000: Department of Chemistry Representative to the former **Faculty of Science Postgraduate Studies Committee (FPSC)**, University of Nairobi.
- Sept. 2000: Member of the Organizing committee for The First Workshop on "**Maintenance and Repairs of Laboratory Equipments**" on September 18<sup>th</sup>-22<sup>nd</sup>, 2000 at the Department of Chemistry, University of Nairobi.
- 1997-1999: **Secretary** to the Committee that successfully developed the four (4) year Bachelor of Science degree program in Industrial Chemistry in the Department of Chemistry, University of Nairobi.
- 1997 -1999: Secretary to a 5-member committee that developed the **Advanced Diploma in Analytical Techniques** program in the Department of Chemistry, University of Nairobi. The committee was chaired by Prof. S.O. Wandiga.
- Jan. - Dec/97: Secretary to the committee that reformulated the Undergraduate and Graduate level courses for the Analytical Chemistry Division, Department of Chemistry, University of Nairobi.
- 1995 - Oct./97: Coordinator of Course SCH 410; undergraduate research project, Department of Chemistry, University of Nairobi -KENYA.
- 1995 - 2006: Department of Chemistry Representative to the Faculty of Science Educational Resource Committee (FSERC), University of Nairobi.

**External & Internal Examination Responsibilities:**

- Sept., 2009: Appointed External Examiner for Ms Nancy Nyamai's M.Sc. thesis entitled: **"Assessment of Acacia Nilotica in Nitrogen Fixation and Nitrogen Availability in the Lake Victoria Basin: A Case Study at Kendu Bay,**

**Rachuonyo District of Western Kenya**"; Faculty of Science, Chemistry Department, Maseno University, Kenya.

- July/08 -2013: Appointed External Examiner for Analytical, Environmental and Physical Chemistry examination papers for the Department of Chemistry, Jomo Kenyatta University of Agriculture Technology.
- Aug/04 -07: Appointed External Examiner for Analytical, Environmental and Physical Chemistry examination papers for the Department of Chemistry, Kenyatta University.
- 28/03/06: Appointed External Examiner for Mr. Shisia Kuboka's M.Sc. thesis entitled; *Soil-Plant Composition in Relation to Micro and Trace Element Requirements for Grazing Cattle in Uasin Gishu District* by the Director, Board of Postgraduate Studies, Kenyatta University - KENYA.
- 20/02/06: Appointed External Examiner for Ms. Grace Nyawira Muchemi's M.Sc. thesis entitled; *Determination of Some Immune Boosting Trace Elements in Selected Food Grains, Herbal Spices, and Fruit Seeds* by the Director, Board of Postgraduate Studies, Kenyatta University - KENYA.
- 23/11/2001: Appointed External Examiner for Mr. Cleophas W. Muhavini's M.Sc. thesis entitled; *Speciation of Lead and Cadmium in Fresh Tobacco and Its Roots*", by the Director, Board of Postgraduate Studies, Kenyatta University - KENYA.
- 20/11/2001: Invited to serve as Internal Examiner for Mr. G.O. Oyamo's M.Sc. degree thesis entitled; *Identification by Saturation Mutagenesis of Single Residue involved in the  $\alpha$ -Galactosidase AGAB Regioselectivity*; University of Nairobi -KENYA.
- 13/09/2000: Served as Member of the Board of Examiners for Mr. Nyongesa F. Wanjala's Ph.D. thesis entitled; *Influence of Composition and Temperature on Physio-Mechanical Properties of a Kenyan Triaxial (Quartz-Feldspar-Kaolin) Porcelain*. University of Nairobi -KENYA.
- 12/05/99: Served in the Board of Examiners meeting as Internal Examiner for Mr. D.M.K. Onger's M.Sc. thesis entitled; *The Fate of DDT and Chlorpyrifos Applied to a Model Ecosystem Simulating a Tropical Marine Environment*. University of Nairobi -KENYA.
- 17/08/98: Appointed External Examiner for Mr. Charles C. Mbovu's M.Sc. thesis entitled; *Determination of Levels of Nutrients, Organic Matter and Trace Metals in River Migori*. by the Director, Board of Postgraduate Studies, Kenyatta University - KENYA.
- 29/06/98: Appointed External Examiner for Ms. Elizabeth B. Ndinya's Master of Environmental Studies thesis entitled; *Voltammetric Study of Stability Constants and Speciation of Lead in a Tropical Freshwater Environment (Lake Baringo)*. by the Director, Board of Postgraduate Studies, Kenyatta University - KENYA.
- 19/11/97: Served in the Board of Examiners meeting as Internal Examiner for Mr. B.M. Mwashote's M.Sc. thesis entitled; *Sources of Dissolved Inorganic Nutrient Fluxes in the Gazi Bay and Implication for Coastal Ecosystem*. University of Nairobi -KENYA.

- 12/11/97: Served in the Board of Examiners meeting as Internal Examiner for Mr. S.K. Limo M.Sc. thesis entitled; *Investigation of the Physicochemical Properties and Characteristics of Palm Oil*, University of Nairobi -KENYA.
- 1/10/97: Appointed External Examiner for Ms. Pamela Saggar Master of Environmental Studies thesis entitled; *Weevil Repellent Constituent of Chrysanthemum Cinerarefolium* for Grain Protection against the *Sitophilus Zeamais* as a Substitute for Methyl Bromide, by the Director, Board of Postgraduate Studies, Kenyatta University.

**Regional External Examination Responsibilities:**

- Feb., 2010: Appointed External Examiner for Mr. K.J. Gillham M.Sc. thesis entitled: **“A Detailed Kinetic and Mechanistic Investigations into the Rate of Chloride Substitution from Chloro Terpyridine Platinum (II) and Analogous Complexes by a Series of Azole Nucleophiles”**; Faculty of Science & Agriculture, University of KWAZULU-NATAL, Pietermaritzburg, South Africa.
- Nov., 2009: Appointed External Examiner for Mr. Backison M. Tembo PhD thesis entitled: **“Heavy Metal Distribution in the Environment and their Risk Assessment: Case Study of Kabwe and Kitwe”**; Department of Chemistry, School of Natural Sciences, The University of Zambia, Zambia.
- Jan., 2009: Appointed External Examiner for Mr N. Xaba PhD thesis entitled: **“Kinetic and Mechanistic Studies on Hydroboration Reactions of Selected Unsaturated Organic Compounds with Haloborane Addition Complexes: Application of <sup>11</sup>B NMR Spectroscopy”**; Faculty of Science and Agriculture, School of Chemistry, University of KWAZULU-NATAL, Pietermaritzburg, South Africa.
- Sept., 2007: Appointed External Examiner for Mr Thomas Dipogiso Tshipa Sedumen PhD thesis entitled: **“First Year Students’ use of Prior Knowledge in the Learning of Analytical Chemistry”**; Department of Curriculum Studies of the Faculty of Education, University of Pretoria, South Africa.
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