

**UNIVERSITY OF NAIROBI
COLLEGE OF BIOLOGICAL AND PHYSICAL SCIENCES
SCHOOL OF PHYSICAL SCIENCES**

DEPARTMENT OF CHEMISTRY

ANNUAL REPORT

2014

Compiled and edited by:
Prof Amir O. Yusuf,
Chairman, Department of Chemistry

1.1 INTRODUCTION

The Department of Chemistry is located in Chiromo Campus, Off-Riverside Drive. It is part of School of Physical Sciences, College of Biological and Physical Sciences. We handled about 259 undergraduate, 49 MSc and 13 Ph.D students of our own bringing the total population to three hundred and twenty one. In addition we handled a total of 1080 students from other schools and faculties. These students were served by 76 staff. In this period we offered 5 undergraduate and 7 postgraduate programs in various areas.



Chemistry Building

1.2 PROGRAMS OFFERED

The Department offered the following undergraduate degree programmes:

1.2.1 Undergraduate Programs

B.Sc. in industrial chemistry

B.Sc in chemistry

BSc in analytical chemistry

BSc in environmental chemistry

1.2.2 Postgraduate Programs

M.Sc. in Chemistry

M.Sc. in environmental chemistry

M.Sc. in analytical chemistry

M.Sc. in industrial chemistry

M.Sc. in organic chemistry

M.Sc. in inorganic chemistry

Ph.D (chemistry)

1.3 NUMBER OF STUDENTS ENROLLED IN UNDERGRADUATE AND POSTGRADUATE PROGRAMMES

1.3.1 Undergraduate program enrolment

Program	Number of students
BSc Chemistry	101
BSc. Analytical chemistry	12
BSc. Industrial chemistry	148
TOTAL	261

1.3.2 Postgraduate program enrolment

1.3.2.1 MSc

Program	Number of students
M.Sc. Chemistry	18
M.Sc. in Environmental Chemistry	21
M.Sc. in Analytical Chemistry	8
M.Sc. in Industrial Chemistry	2
TOTAL	49

1.3.2.2 Doctor of Philosophy in Chemistry (PhD)

Programme	Number of students
Ph.D. in Chemistry	13

1.3 INTERNATIONAL STUDENTS

The department hosts a number of international students undertaking postgraduate programs.

They were as follows:

#	Reg no	Name	Programme	Home Country
1	I56/79318/12	Uphrosine Ujeneza	MSc Industrial	Rwanda

			Chemistry	
2	I56/69593/11	Fozia Ali Adem	PhD Chemistry	Ethiopia
3	I80/92721/13	Assefa Yoseph Atilaw	PhD Chemistry	Ethiopia
4	I80/85101/12	Tsegaye Deyou	PhD Chemistry	Ethiopia
5	I80/94474/14	Souaibou Youba	PhD Chemistry	Cameroun
6	PROVISIONAL	Daniel Buyinza	PhD Chemistry	Uganda

1.4 Research activities

1.4.1 M.Sc research

Student	Title of Research	Research Supervisor(s)
Kwesiga George I56/68908/2013	Phytochemical investigation and structure modification of antimicrobial principles of <i>Erythrina sacleuxii</i> and <i>Erythrina melanacantha</i> .	Prof. A. Yenesew Dr. A. Ndakala
Gachuhi Samuel N. I56/67848/2013	Synthesis And Bio-Assay Of 2-Chloro 5-Methoxy-3 Methylcyclohexa-2, 5-Diene-1, 4-Dione, A Natural Benzoquinone Metabolite Isolated From The Endophytic Fungi <i>Xylaria Sp.</i> And Its Analogues	Dr. A. Ndakala Dr. S. Derese
Renee Rosebella Munayi I56/67098/2013	Investigation Of <i>Tabernaemontana Stapfina Britten</i> And <i>Synsepalum Cerasiferum</i> For Cytotoxicity Against Drug Sensitive And Multidrug Resistant Cancer	Dr. L. Kerubo Prof. J. Midiwo
Omulama Nyangweso Jacob I56/68812/2013	Determination Of Polycyclic Aromatic Hydrocarbons In Sugar Industrial Effluents In Western Kenya	Dr. V. Madadi Prof. S. Wandiga
Birgen Jael Cheptoo I56/ 67355/ 2013	Determination Of The Level Of Air Pollutants In A Cement Factory In Athi River, Kenya.	Prof. A. Yusuf Mr. G. Wafula Dr. J. Onyatta
Andere Clement Miruka I56/69022/2013	Air Quality Assessment From Kikuyu To Athi River Via Nairobi	Prof D.K. Kariuki Prof. A. Yusuf Mr. G. Wafula Dr J. Onyatta

Bernard Oyucho I56/68811/2013	Determination Of Methanol Content In Some Selected Beverages In Informal Settlements In Nairobi County	Prof. A. Yusuf Dr. J. Onyatta Dr D. Abong'o
Abdolahi Mohamed Adawe I56/67284/2013	Fluoride Profiling In Some Selected Boreholes In Mogashishu, Somalia	Prof. A. Yusuf Dr. J. Onyatta Mr. G. Wafula
David Muthura Kingori I56/68663/2013	Air Quality Assessment Within Nakuru Region And It's Environs	Prof D.K. Kariuki Prof A. Yusuf Mr. G. Wafula
Njombai D. Mbugua I56/67514/2013	Indoor Air Quality: An Analysis For Volatile Organic Compounds (Vocs) In The Chemistry Department Building, Chiromo Campus	Dr. J. Wanjohi Mr. G. Wafula Prof. D. K. Kariuki
Vinton Jefferson Johnson I56/69104/2013	Water Quality Trends Of Lake Naivasha In Riff Valley Of Kenya	Prof. D. K. Kariuki Prof. D. N. Kariuki Dr. D. Mbui
Ondiere Vene Bonareri I56/67533/2013	Environmental Pressures That Affect Water Quality Of Lake Elmentaita Kenya	Dr. V. Madadi Dr. A. Aluoch Dr F. Oduor
Ochiba Khayongo Nancy I56/68822/2013	Preparation Of Plastics From Readily Available Biomass	Prof. G. Kamau Prof. Mugweru
Chebon Kiplagat Sammy I56/69003/2013	Extraction And Characterization Of Gelatin From Fish Scales, Polymer Blends Formulation And Evaluation Of Potential Industrial Application	Prof. J.M Onyari Prof. F. Mulaa Dr. J. Wabomba
Mapili Millicent Mapili I56/70099/2013	Assessment Of The Effect Of Calcination Temperatures On The Performance Of H ₃ po ₄ And Zncl ₂ Activated Carbon From Coconut Shells, Maize Cobs And Bamboo Materials	Prof. S. Wandiga Dr. V. Madadi Dr. D. Abongo
Emily Kwamboka Okworo I56/68460/2013	The Fate And Transport Of Pesticides Used In Naivasha Area (A Study On The Maximum Residue Levels Of Pesticides Applied On Flowers And Vegetables)	Dr. V. Madadi Dr. A. Aluoch Dr. Abongo
David Daniel Muendo I56/68662/2013	Investigating Effect Of Heavy Metal Pollution On Omega-3 Polyunsaturated Fatty Acids Levels In Nile Talapia Fish From Pollution –Simulated Aquraia	Dr. V. Madadi Prof. E.K. Nguu Prof. D. O. Ogoyi,
Elizabeth Mbithe Mutua I56/69828/2013	Assessment Of Trace Metals Levels In The Drill Cutting Waste From Onshore Oil Exploratory Wells In Turkana	Prof. G. N. Kamau Dr. C. Nyamai
Malinga Daniel Kapsandui I56/68698/2013	Alternative Use Of Beer Manufacturing Wastes	Dr. J. Wanjohi Dr. D. Mbui
Maimuna Hussen	Assessment Of Bore Hole Waters Of	Prof. A. Yusuf

I56/69350/2013	Mandera Town And Its Environs, Mandera County	Mr. G. Wafula
Hinga Mbugua I56/80889/2012	The Effect Of Septic Tank Site On Borehole Water Quality In Ongata Rongai In Kajiado North County, Kenya	Dr. D. Abongo Dr. J. Onyatta
Josephat M. Kamiri I56/81213/2013	A Comparitive Study Of Environmental Impacts Of Borehole Projects Within Kiambu, Nairobi And Kajiado Counties	Dr. F. Oduor Prof. D. K. Kariuki
Mr Ahmed Emad Eldin	Antimicrobial and phytochemical analysis of selected medicinal plants	Prof. F. B. Mwaura Dr S.F. Dossaji.
Mr Makungu Marco	Phytochemical and pharmacological studies of <i>Millettia</i> species of Tanzanian origin	Prof. A. Yenesew Dr S. Derese.
Ms Daisy Nyawira Njeru	Alkaloids from <i>Teclea simplicifolia</i> (UoN, writing her thesis).	Prof. A. Yenesew Dr S. Derese

1.4.2 Ph.D research

Student	Title	Supervisor(s)
Doris Situma I80/81561/2011	Risk identification and catalytic oxidation of endocrine disrupting compounds in effluents from sewage treatment plants and light industries in Nairobi	Prof. S. Wandiga Prof. P. Shiundu Dr. B. Wamalwa
Mrs. Ruth Odhiambo I80/80750/2010	Synthesis of bionucleating macrocycles incorporating thiolato and polyether compounds fused to 1,10-phananthroline as sensors for soft heavy metal	Prof. S.O. Wandiga Dr. Au. Ochieng'
Immaculate Achieng' I80/81921/2009	Evaluating the efficacy of selected lignocellulosic materials of Kenyan origin in the adsorption of textile dyes and inks from aqueous industrial effluents	Prof. P.M. Shiundu Dr. A. Aluoch Dr. B. Wamalwa
Oyagi Moses Ondabu I80/95787/2014	New electrochemical sensor for selected heavy metal pollutants in drinking and wastewaters	Dr. P. Guto Dr. J. Onyatta Prof. G. Kamau
Kimutai Patrick Tum I80/93563/2013	Photocatalytic treatment of wastewater from selected tea factories in Kenya	Prof D.K. Kariuki Dr. F. Oduor Dr. J. Wanyoko
Mwenda Nicholas I80/9448/2012	Detoxification of Aflotoxin Contaminated Maize	Prof. S. Wandiga Prof. D. K. Kariuki Dr. V. Madadi
Mogwasi Richard I80/26723/2013	Speciation, analysis of selected trace elements in selected medicinal plants from Nyamira County	Prof D.K. Kariuki Prof Z. Getenga

Okemwa Evans Kenanda I80/85661/2012	Bioassay, isolation and synthetic optimization of compounds of polygonum senegalense and t. for their bioactive effects	Prof J. Midiwo Dr A. Ndakala Dr L. Kerubo
Wanyonyi Wycliff Chisutia I80/90861/2013	Isolation of biomass modifying enzymes for bioremediation and production of green specialty chemical products	Prof J. Onyari Prof PM Shiundu Prof J. Mulaa
Muinde Veronica Mwikali I80/92722/2013	Adsorption of organophosphorus Pesticides and Organic dyes onto Synthetic and Natural Polymers and their Biodegradation using selected Micro-organisms	Prof J. Onyari Dr. B. Wamalwa Dr. J. Wabomba
Fozia Ali Adem PROVISIONAL	Phytochemical analysis of four armocergum species for anticancer activity	Prof A. Yenesew Dr. A. Ndakala
Yoseph Atilaw Assefa I80/92721/2013	Phytochemical Investigation of Selected Fabaceae and Rutaceae Plants for Anti-inflammatory Principles	Prof A. Yenesew Dr. A. Ndakala Dr. H. Kariuki
Mwazhighe Fredrick PROVISIONAL	Nanometallic and organic acid doped ultrasensitive polymeric nanosensor platform for detection of polycyclic hydrocarbons	Prof G. Kamau Dr N. Njomo
Rachel E. Njogu PROVISIONAL	Selected hydrogenation of furfural by Ni/TiO ₂ catalyst	Prof D.K. Kariuki Prof L. Njenga Prof A.O. Yusuf
Mr Souaibou Yaouba I80/94474/2014	Isolation of pharmacologically bioactive compounds from some medicinal plants in the families Meliaceae and Asclepiadaceae	Prof. A. Yenesew Dr F. Okalebo Dr S. Derese.
Mr Yoseph Atilaw I80/92721/2013	Isolation and characterization of antipain compounds from some medicinal plants	Prof. A. Yenesew Dr A. Ndakala Dr H. Kariuki.
Mr Tsegaye Deyou Woldemedihin I80/85101/2012	Phytochemical investigation of plants of the Ochnaceae and Leguminosae families for cancer chemoprevention	Prof. A. Yenesew Dr S. Derese Prof. M. Erdélyi.
Ms Lois Muiva Mwikali Mutisya I80/81681/2011	Phytochemical analysis of <i>Tephrosia</i> species found in Kenya for antimalarial and antioxidant principles	Prof. A. Yenesew Dr S. Derese Dr F. Okalebo Dr C. Mutai
Ms Martha Induli	Phytochemical studies of some Kenyan species of the family Asphodelaceae	Prof. Robert Byamukama Prof. Abiy Yenesew

Ms Judith Agot Odhiambo	Phytochemical investigation of some Kenyan plants for antifungal activities	Prof. A. Yenesew Dr. Saiffudin Dossaji Dr Catherine Lukhoba.
Kiplagat S.C.	Extraction and Characterization of Gelatin From Fish Scales and Potential Industrial Applications	Prof. J.M. Onyari Dr.J Wabomba Dr. J. Wabomba

1.5 INTERNATIONAL LINKS AND COLLABORATIONS

The Department had the following new links with:

The State University of New York, Binghamton –UoN linkage; Grand Challenges Canada and Volkswagen Stiftung; Institute of Chemistry, University of Potsdam, Germany; Department of Chemistry, University of Gothenburg, SE-412 96 Gothenburg, Sweden.

1.6 LIST OF RESEARCH PUBLICATIONS 2014

1. Solomon Derese, Leonard Barasa, Hosea Akala, Amir O. Yusuf, Matthias Heydenreich and Abiy Yenesew (2014). “4'-Prenyloxyderrone from the stem bark of *milletia oblate ssp. teitensis* and the antiplasmodial activities of isoflavones from some *milletia* species” *Phytochemistry Letters*, **6** (2), p. 69-72.
2. Amir Yusuf, Peter Gitu, Bhalendu Bhatt, Martin Njogu, Ali Salim and Duke Orata (2014). “1-Tetralinyl as carboxamide protecting group for asparagines and application to N-alpha-t-butyloxycarbonyl (Boc) solid-phase peptide synthesis of oxytocin”. *Journal of Chemistry and materials research*, **6** (2), p 1-11.
3. Duke Orata, Yusuf Amir and Claire Ninneza (2014). “Derivatized electrodes in the electroanalysis of pyrimethamine and/or 2-sulfanilamido-3-methoxypyrazine(metakelfin) and lumefantrine / artemether (Coatem)” *Journal of Chemistry and chemical engineering*, **8**, p. 215-225.
4. Amir Yusuf, Peter Gitu, Bhalendu Bhatt, Martin Njogu, Ali Salim and Duke Orata (2014). “Solid-Phase Peptide Synthesis of Arginine-vasopressin With Amide Side chain of Asparagine Protected With 1-Tetralinyl Group. *Journal of Chemistry and materials research*, **6** (4), p 60-65.
5. Duke Orata, Yusuf Amir, Claire Nineza, Damaris Mbui and Marina Mukabi (2014). “Surface modified electrodes used in cyclic voltammetric profiling of quinine, as antimalarial drug”. *IOSR Journal of Applied Chemistry*, **7**(5, ver. II), p 81-89.

6. Duke Orata, Yusuf Amir, Claire Nineza and Marina Mukabi (2014). "Electrochemical characterization of amoxicillin, a broad spectrum antibiotic on a bentonite host matrix, using cyclic voltammetry". *IOSR Journal of Applied Chemistry*, **7**(5, ver. III), p 50-58.
7. Duke Orata, Yusuf Amir, Claire Nineza, Marina Mukabi and Damaris Mbui (2014). "Surface modified electrode used in the electro-analysis of N-acetyl p-aminophenol-A pharmaceutical drug" *IOSR Journal of Applied Chemistry*, **7**(5, ver. II), p 90-99.
8. Duke Orata, Yusuf Amir and Claire Nineza (2014). "Electroanalysis of unconventional (herbal) drugs using surface modified electrodes in conjunction with cyclic voltammetry". *IOSR Journal of Applied Chemistry*, **7**(5, ver. II), p 56-62.
9. Duke Orata, Hellen Njenga, Marina Mukabi, Yusuf Amir and Damaris Mbui (2014). "Polyaniline and polythiophene modified electrodes in energy storage units with hydrocarbon gel/bentonite/sodium chloride as electrolyte gel". *IOSR Journal of Applied Chemistry*, **7**(5, ver. II), p 63-80.
10. Duke Orata, Marina Mukabi, Helen Njenga and Yusuf Amir (2014). "Electrochemical characterization of polypyrrole electrosynthesized on a montmorillonite host-matrix, in aqueous media containing sulphuric acid as supporting electrolyte". *IOSR Journal of Applied Chemistry*, **7**(5, ver. III), p 59-72.
11. Duke Orata, Hellen Njenga, Marina Mukabi and Yusuf Amir (2014). "Sodium thiosulphate, a novel electrocatalyst in the electrosynthesis of electronically conducting polymer-polythiophene" *IOSR Journal of Applied Chemistry*, **7**(5, ver. III), p 73-85.
12. Preston Akenga, Ali Salim, Anam Onditi and Amir Yusuf (2014). "Determination of selected micro and macronutrients in sugarcane growing soils in Kakamega North District, Kenya" *IOSR Journal of Applied Chemistry*, **7**(7, ver. I), p 34-41.
13. Riungu, A.M. Salim, J. Njenga, A. Yusuf and W. Waudu (2014). "Bioethanol production from waste crops and crop residues" *IOSR Journal of Applied Chemistry*, **7**(7, ver. I), p 42-47.
14. Mwazighe F., Kamau G. and Mwaniki J. (2014). "Anaerobic Digestion of Sewage Wastewaters with Sludge and Rumen Fluid", *European International Journal of Science and Technology*, **3**, Pg 6

15. Njeri R. and Kariuki D.K. (2014). “Effect of Foliar Fertilizer Application on Quality of Tea (*camara sinensis*) Growth in the Kenyan Highlands”, *American Journal of Plant Sciences*, **5**, p
16. Mbui, D. and Kamau, G. (2014). “Adsorption of Dursban (Chlorpyrifos) pesticide by loam soil from Limuru, Kenya, Apparent Thermodynamic Properties”, *African Journal of Physical Sciences*, **1**, p 1
17. Kariuki D.K. and Kerubo L. (2014). “Antibacterial activity of five medicinal plant extracts used by Maasai people of Kenya”, *International Journal of Humanities, Arts, Medicine and Sciences*, **2**, p 1-6
18. Michira I.N., Katithi D.N., Guto P.M., Kamau G.N., Baker P. and Iwuoha E. (2014). “Synthesis, characterization of green tea stabilized iron nanoparticles and their synergistic effect on polyaniline”, *International Journal of Sciences*, **13 (2)**, p 63-76
19. Katithi D.N., Michira I.N., Guto P.M., Baker P.G.L., Kamau G.N. and Iwuoha E. (2014). “Green synthesis of iron nanoparticles on chamomile in-built templates”, *European International Journal of Applied Sciences and Technology*, **1 (5)**, p
20. Wandiga S.O., Abong’o D., Madadi V., Kynin H. and Jumba I. (2014) “Pesticides on human health and the environment in the River Nyando catchment, Kenya”, *International Journal of Humanities, Arts, Medicine and Sciences*, **2(3)**, p. 1-14
21. Tum P.K. and Oduor F.D.O. (2014) “Effects of calcinations temperature on TiO₂ photocatalyst morphology”, *J. Kenya Chemical Society*, **8(1)**, p. 26-32
22. Muiva-Mutisya , Bernard Macharia, Matthias Heydenreich, Andreas Koch, Hoseah M. Akala, Solomon Dereese, Leonidah K. Omosa, Amir O. Yusuf, Edwin Kamau and Abiy Yenesew. (2014). 6 α -Hydroxy- α -toxicarol and (+)-Tephrocin with antiplasmodial activities from *Tephrosia* species. *Phytochemistry Letters* 10, 179–183.
23. Ivan Gumula, John Patrick Alao, Isaiah Omolo Ndiege, Per Sunnerhagen, Abiy Yenesew and Máté Erdélyi (2014). Cytotoxic and Antioxidant Flemingins G-P from the Leaves of *Flemingia grahamiana*. *Journal of Natural Products* 77, 2060-2067.
24. Irungu, B.N., Orwa, J.A., Gruhnojic, A., Fitzpatrick, P., Landberg, G., Kimani, F., Midiwo, J.O., Erdélyi M., Yenesew, A. (2014). Constituents of the roots and leaves of

- Ekebergia capensis* and their potential antiplasmodial and cytotoxic activities. *Molecules* 19, 14235-14246;
25. Atilaw Y., Heydenreich M., Ndakala A., Akala H.M., Kamau E. and Yenesew, A. (2014). 3-Oxo-14 α ,15 α -epoxyschizozygine: A new schizozygane indoline alkaloid from *Schizozygia coffaeoides*. *Phytochemistry Letters*. 10, 28-31.
 26. Odhiambo L., Dossaji S., Lukhoba C. and Yenesew A. (2014). Phytochemical screening of *Dierama cupuliflorum* Klatt. (Iridaceae). *Journal of Pharmacy Research* 8, 589-592.
 27. Bosire C.M., Deyou T., Kabaru J.M., Kimata D.M. and Yenesew A. (2014). Larvicidal activities of extracts and rotenoids from *Millettia usaramensis* subspecies *usaramensis* on *Aedes aegypti* (Linnaeus, 1762) (Diptera: Culicidae). *Journal of Asia-Pacific Entomology* 17, 531-535.
 28. Abdissa N., Heydenreich M., Midiwo J.O., Ndakala A., Majer Z., Neumann B., Stammler H.-G., Sewald N. and Yenesew A. (2014). 8-Hydroxy-6-methylxanthone-1-carboxylic acid and 6',8-*O*-dimethylknipholone from the roots of *Bulbine frutescens*. *Phytochemistry Letters* 9, 67-73.
 29. Abdissa N., Induli M., Fitzpatrick P., Alao J.P., Sunnerhagen P., Landberg G. Yenesew A. and Erdelyi, M. (2014). Cytotoxic Quinones from the Roots of *Aloe dawei*. *Molecules*. 19, 3264-3273.
 30. Derese S., Barasa L., Akala H.M., Yusuf A.O., Kamau E., Heydenreich M. and Yenesew A. (2014). 4-*O*-Prenyloxyderrone from the stem bark of *Millettia oblata* ssp. *teitensis* and the antiplasmodial activities of isoflavones from some *Millettia* species. *Phytochemistry Letters* 8, 69-72.
 31. L. K. Omosa, B. Amugune, B.Ndunda, Trizah K., T. K. Milugo, M. Heydenreich, A.Yenesew and J.O. Midiwo (2014). Antimicrobial flavonoids and diterpenoids from *Dodonaea angustifolia*. *South African Journal of Botany*. 91, 58-62.
 32. Kithure J.G.N., Murungi J.I., Wanjau R.N. and Thoruwa C.L. (2014). Analysis of Deltamethrin Residue amounts using HPLC in some vegetables consumed in a Rural area-Makuyu, Kenya. *The IJST Journal* Volume II. Issue XII.
 33. Wycliffe Chisutia Wanyonyi, John Mmari Onyari, Paul Mwanza Shiundu, Francis Jackim Mulaa. **Enzymatic Decolorization of Malachite Green Dye by a Newly Isolated *Bacillus Cereus* Strain wwcp1**, *IOSR Journal of Environmental Science, Toxicology and Food Technology* e-ISSN: 2319-2402. Volume 8, Issue 12 Ver. III (Dec. 2014), PP 58-64.
 34. W. O. Osawa W.O, Onyari JM, Sahoo PK , Mulaa FJ (2014). **Process optimization for production of biodiesel from croton oil using two-stage process**, *IOSR Journal*

- of *Environmental Science, Toxicology and Food Technology (IOSR-JESTFT)* e-ISSN: 2319-240,. Volume 8, Issue 11 Ver. III (Nov. 2014), PP 49-54.
35. Ali Shee, John Mmari Onyari, John Namakwa Wabomba, Daniel Munga (2014). **Methylene Blue Adsorption onto Coconut husks/Poly lactide Blended Films: Equilibrium and Kinetic Studies**, Chemistry and Materials Research www.iiste.org ISSN 2224- 3224 (Print) ISSN 2225- 0956 (Online) Vol.6 No.11, 2014
 36. Davis Amboga Anzeze , John Mmari Onyari , Paul Mwanza Shiundu, John W Gichuki (2014). **Equilibrium and Kinetics studies for the biosorption of aqueous Cd (II) ions onto *Eichhornia crasippes* biomass**, *IOSR Journal of Applied Chemistry (IOSR-JAC)* e-ISSN: 2278-5736. Volume 7, Issue 1 Ver. II. (Feb. 2014), PP 29-37
 37. Wycliffe Chisutia Wanyonyi* John Mmari Onyari, Paul Mwanza Shiundu (2014) Adsorption of Congo Red Dye from Aqueous Solutions Using Roots of *Eichhornia crassipes*: Kinetic and Equilibrium Studies, The International Conference on Technologies and Materials for Renewable Energy, Environment and Sustainability, TMREES14, Energy Procedia (2014).
 - 38 **Davis Amboga Anzeze, John Mmari Onyari, Paul Mwanza Shiundu, and John W Gichuki** (2014). Biosorption of Zn (II) ions from aqueous solutions by water hyacinth (*Eichhornia crasippes*): Equilibrium and Kinetic studies, International Journal of Innovation and Scientific Research, ISSN 2351-8014 Vol. 8 No. 2 Sep. 2014, pp. 224-233.
 - 39 **Davis Amboga Anzeze, John Mmari Onyari, Paul Mwanza Shiundu, John W Gichuki** (2014) Adsorption of Pb (II) ions from aqueous solutions by water hyacinth (*Eichhornia crassipes*): Equilibrium and Kinetic studies, *International Journal of Environmental Pollution and Remediation* Volume 2, Year 2014 Journal ISSN: 1929-2732

1.7 CONSULTANCIES UNDERTAKEN BY STAFF

Client	Parameter	Staff involved
Kenyatta University	Training on NMR	Mr Mirikau, Prof Abiy, Prof Yusuf
OSHO	GC-MS analysis of various samples	Mr. Mirikau
KEWI	Practical training on instrumentation (AAS, GC-MS, UV/VIS, IR, FLAME PHOTOMETER)	Mr Mirikau, Dr Madadi, Ms Macharia, Mr Katembu, Mr Orangi, Ms Checha, Prof Yusuf
PWC	Energy content of various samples	Prof Kithinji, Prof Yusuf, Mr Kimega
Kabete Technical College	Academic Visit	Mr Mirikau, Dr Wanjohi, Ms Mutungi, Mr Ng'ang'a
Assia Animal Health	GC analysis	Dr Madadi, Mr Mwangi
Directorate of Criminal Investigation	Various tests on suspected illegal drugs	Mr Wafula, Prof Yusuf

1.8 NUMBER OF STAFF AND THEIR DESIGNATIONS

Professor	6
Associate Professor	11
Senior Lecturers	10
Lecturers	14
Tutorial Fellows	5
Assistant Lecturer	1
Graduate Assistants	1
Principal Technologist	1
Chief Technologist	1
Senior Technologist DEF	12
Technologist ABC	9
Technical Assistant II	1
Documentalist	1
Senior Administrative Assistant	1
Secretary	2
TOTAL	76

1.9 NUMBER OF GRADUANDS IN VARIOUS PROGRAMMES 2014

Year	BSc Industrial Chemistry	BSc Analytical Chemistry	MSc In Chemistry	MSc Environmental Chemistry	MSc Industrial Chemistry	Ph.D in Chemistry	Total
2013/2014	29	2	12	2	1	5	51

1.10 PAPERS PRESENTED AT CONFERENCES

Title of the Paper	Date presented	Venue
Adsorption of Pesticides and Organic Dyes in Water on Selected Adsorbents and their Biodegradation using Selected Microorganisms	13/08/ 2014	Chiromo Campus, Nairobi, Kenya
Phytochemical Investigation of Four Asphodelaceae Plants for Anti-plasmodial Principles	05/08/2014	Chiromo Campus, Nairobi, Kenya
Using Modified Titanium (iv) Oxide System for use in the improvement of Quality of Drinking Water	24/07/2014	Chiromo Campus, Nairobi, Kenya
Phytochemical Investigation of Some Fabaceae and Rutaceae Plants for anti-inflammatory Principles	10/07/2014	Chiromo Campus, Nairobi, Kenya
Phytochemical Investigation and Structure Modification of Antimicrobial Principles of <i>Erythrina melanacantha</i> and <i>Erythrina saclexii</i>	15/08/2014	Chiromo Campus, Nairobi, Kenya
Synthesis and Bio-assay of 2-chloro-5--methoxy-3-methylcyclohexa-2,5-diene-1,4-dione, a natural benzoquinone metabolite isolated from the endophytic fungi <i>Xylaria Sp.</i> And its analogues	15/08/2014	Chiromo Campus, Nairobi, Kenya
Phytochemical Investigation of <i>Bridelia micrantha</i> for cytotoxicity against drug sensitive and Multi-drug resistance cancer cell lines	15/08/2014	Chiromo Campus, Nairobi, Kenya
Determination of Polycyclic aromatic hydrocarbons in Sugar industrial Effluents in Western Kenya	15/08/2014	Chiromo Campus, Nairobi, Kenya
Determination in the Level of air pollutants in a cement factory in Athi river, Kenya	15/08/2014	Chiromo Campus, Nairobi, Kenya
Air Quality Assessment from Kikuyu to Athi River via Nairobi	15/08/2014	Chiromo Campus, Nairobi, Kenya
Anaysis of Methanol, an Adulterant in in Alcoholic Beverages Using Gas Chromatography and UV-Visible Spectrophotometry: A case Study of Nairobi Country	15/08/2014	Chiromo Campus, Nairobi, Kenya
Flouride Profiling in Some Selected Boreholes in Mogadishu, Somalia	15/08/2014	Chiromo Campus, Nairobi, Kenya
Air Quality Assessment within Nakuru region and its environs	15/08/2014	Chiromo Campus, Nairobi, Kenya

Assessment Levels of Airborne Particulate Matter and Heavy Metals Content in Selected Quarries in Ndarugo, Juja	15/08/2014	Chiromo Campus, Nairobi, Kenya
Water Quality Trends of Lake Naivasha in Rift Valley of Kenya	15/08/2014	Chiromo Campus, Nairobi, Kenya
Environment Pressures that affect Water Quality of Lake Elementaita, Kenya	15/08/2014	Chiromo Campus, Nairobi, Kenya
Preparation of Plastics from Readily available biomass	15/08/2014	Chiromo Campus, Nairobi, Kenya
Extraction and Characterization of Gelatin from Fish Scales, polymer blends Formulation and Evaluation of Potential Industrial Application	15/08/2014	Chiromo Campus, Nairobi, Kenya
Assessment of the effect of Calcinations Temperatures on the Activated Carbon from Coconut shell, maize and bamboo materials	15/08/2014	Chiromo Campus
The Fate and Transport of Pesticides used in Naivasha area (a study on the maximum residue levels of pesticides applied on flowers and vegetables)	15/08/2014	Chiromo Campus, Nairobi, Kenya
Investigating effect of heavy metals pollution on Omega-3 polyunsaturated fatty acids levels in Nile Tilapia from pollution-simulated aquaria	15/08/2014	Chiromo Campus, Nairobi, Kenya
Assessment of Trace Metals Levels in the Drill Cutting Waste from onshore oil exploration well in Turkana	15/08/2014	Chiromo Campus, Nairobi, Kenya
Alternative Use of Beer Manufacturing Waste	15/08/2014	Chiromo Campus, Nairobi, Kenya
Red hot compounds from the red hot poker plant, Kniphofia, and related taxa,	19-24/10/2014.	Shanghai, China
(+)-Tephrocin - A New Flavone from Tephrosia purpurea.	29/9/2014 – 2/10/ 2014	Berlin, Germany
Larvicidal activities of extracts and rotenoids from Millettia usaramensis on Aedes aegypti.	22/2/ 2014	Chiromo Campus, University of Nairobi.

1.11. CORPORATE SOCIAL RESPONSIBILITY/OUTREACH SERVICES

1. Prof. J.O. Midiwo: External examiner, Department of Chemistry, Maseno University
2. Prof. D.K. Kariuki: KEBS Water Quality committee; NEMA Hazardous and Toxic Materials committee member; WRMA Threshold Pollution in Waste Water Committee.
3. Dr. B.M. Wamalwa: Board member of Japan Government scholarships
4. Prof. Wandiga S.O.: Chancellor, Egerton University; Pan African Chemistry Network Chairman, Regional Chapter; UNEP/GEF-UoN Project coordinator, UNEP POPs project coordinator
5. Prof. A.O. Yusuf: External examiner Department of Chemistry, JKUAT; IDB Scholarship Selection Committee Board Member
6. Department hosted the following: Maseno University students who came to learn instrumentation techniques; KEWI students who were given hands-on experience in use of various instruments (IR, GC-MS, AAS, UV/VIS); Invited secondary schools and technical colleges who were taken through the running of various experiments.
7. Prof. A. Yenesew: External examiner for PhD thesis by Ms Jane Namukobe entitled Phytochemical and Antiplasmodial Studies of *Neoboutonia macrocalyx* L. ,Department of Chemistry, Makerere University
8. Prof. A. Yenesew: External examiner for MSc thesis by Waithaka Wamburu entitled Acute and sub-acute toxicological studies of *Prosopis juliflora* (Fabaceae) from Marigat District, Kenya. Department of Chemistry, Jomo Kenyatta University of Agriculture and Technology, Kenya,

1.12 OTHER ACTIVITIES

1.12.1 Promotion

Senior lecturer to associate professor (Dr. David K. Kariuki, Dr. Amir O. Yusuf, Dr. Hellen Njenga and Dr. Jacob P. Kithinji); Lecturer to senior lecturer (Dr. Leonida Kerubo ,Dr. Peterson Guto, Dr. Albert Ndakala, Dr. Martin Njogu, Dr. Fred Oduor and Dr. John Wanjohi); Graduate assistant to tutorial fellow (Mr. Fredrick Mwazighe, Mr Patrick Tum); tutorial fellow to lecturer (Dr John Wabomba, Dr Vincent Madadi, Dr Njomo Njagi and Dr Erick Korir); Technologist to senior technologist (Ms Marion Checha)



Yusuf Njenga Kariuki Kithinji Kerubo Mwazighe Guto

1.12.2 Public lecture

Deputy Director-OPCW visited the Department/College and delivered a public lecture on operations of OPCW.

1.12.2 Conference/workshop/symposium

Department hosted the following:

Royal Society of Chemistry-Proctor & Gamble conference 4-5th November 2014; UNEP workshop 30-31st October 2014; International Science Program (ISP) Symposium 17-19th November 2014