

ChemNEWS

Department of Chemistry, University of Botswana

MISSION STATEMENT: The Department of Chemistry of the University of Botswana has the primary mission of producing the future scientists of Botswana in the Chemical sciences. This shall be accomplished through the attainment of excellence in teaching and research training and shall be reinforced by the establishment of strong professional alliances with appropriate bodies and practicing chemists within and outside Botswana.

From The Desk of the Head of Department

On behalf of the staff and the students of the Department of Chemistry, I present to you the second issue of the 2018 addition of *ChemNEWS*, our flagship newsletter. I also take this opportunity to welcome our new and returning students to the Department and the first semester of the 2018-2019 academic year.



This academic year that started in August 2018 will bring both challenges and opportunities. At the top of our challenges is the unavailability of NMR and mass spectrometry services in the Department. The Department will continue to request the University to replace the obsolete NMR and Mass Spectrometry equipment. The Department will also continue to advocate for the replacement of small equipment such elementary analyzer and Atomic absorption Spectrometer in its efforts to produce graduates that are international competitive and engage in research that is of international standards.

Lastly, let me take this opportunity to encourage, parents and stakeholders to participate in the activities of the Department and constantly engage the Department through the Hto provide any advice. The Department outreach committee is available to visit schools and encourage students to consider a career in chemistry through interesting chemical demonstrations. Schools are also encouraged to allow students to visit the Department during the holiday school trips.

Editor: Prof. I. B. Masesane-Head of the Department

Reviewers: Chemistry Sectional Coordinators

ChemNEWS is a biannual Publication of the Department of Chemistry, University of Botswana

GOALS

- ♦ To achieve a national, regional and international reputation for excellence in the teaching and learning of chemistry and the chemical sciences.
- ♦ To establish a vibrant programme of research and research training focused on the natural resources of Botswana.
- ♦ To acquire a reputation within Botswana and the region for providing excellent professional service and advice to all the Department's clients

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Find the Department of Chemistry in the Science complex at the University of Botswana. Block 237; HoD's office 210; Telephone number 267 3552491/ 3552492

Research and Publication Highlights and News

DEPARTMENT'S JOURNAL ARTICLES, BOOK CHAPTERS AND CONFERENCE PRECEEDINGS

1. Sudheesh, S.; Ahmad, J.; Singh, G. S. Mixed Monolayer of Amphiphilic Schiff Base of ortho-Vaniline and Stearic Acid: Isotherms and Thermodynamic Properties. *Orbital: The electronic Journal of Chemistry* **2018**, 10, 106-112.
2. Keroletswe, N.; Majinda, R. R. T.; Masesane, I. B. A New 3-Prenyl-2-flavene and Other Extractives from *Baphia massaiensis* and Their Antimicrobial Activities. *Natural Products Communications* **2018**, 13, 435-438.
3. Gurmessa, G. T.; Kusari, S. (Kusari, S; Laatsch, H.; Bojase, G.; Tatolo, G.; Masesane, I. B.; Spiteller, M.; Majinda, R. R. T. Chemical constituents of root and stem bark of *Erythrina brucei*. *Phytochemistry Letters* **2018**, 25, 37-42.
4. Armwood, S.; Juma, B. F.; Ombito, J. O. Majinda, R. R. T.; Gwebu, E. T. Effect of erythraline alkaloids from *Erythrina lysistemon* on human recombinant caspase-3. *African Journal of Pharmacy and Pharmacology* **2018**, 12, 183-187.
5. Tafesse, G.; Mekonnen, Y.; Makonnen, E.; Majinda, R. R. T.; Bojase-Moleta, G.; Yeboah, S. O. Antibacterial activity of crude extracts and pure compounds isolated from *Vernonia galamensis* leaves. *African Journal of Pharmacy and Pharmacology* **2018**, 12, 136-141.
6. Ombito, J. O.; Majinda, R. R. T.; Masesane, I. B.; Bojase, G.; Schüffler, A.; Opatz, T. Prenylated isoflavones from the stem bark of *Erythrina saculeuxii*. *Phytochemistry Letters* **2018**, 26, 110-114.
7. Yeboah, S. O.; Oathotse, I.; Ddamba, W. A. A. Physicochemical Properties of Mixtures of Morama Seed Oil With Alkanols and Alkyl Acetates at 298.15 K Atmospheric Pressure. *Journal of the American Oil Chemists Society* **2018**, 95, 653-663.
8. Kuete, V.; Ngnintedo, D.; Fotso, G. W.; Karaosmanoglu, O.; Ngadjui, B. T.; Keumedjio, F.; Yeboah, S. O.; Andrae-Marobela, K.; Sivas, H. Cytotoxicity of seputhecarpan D, thonningiol and 12 other phytochemicals from African flora towards human carcinoma cells. *BMC Complementary and alternative Medicine* **2018**, 18, article number 36.
9. Sichilongo, K.; Mwando, E.; Sepako, E.; Massele, A. Comparison of efficiencies of selected sample extraction techniques for the analysis of selected antiretroviral drugs in human plasma using LC-MS. *Journal of Pharmaceutical and toxicological methods* **2018**, 89, 1-8.
10. Singh, G. S.; Sudheesh, S.; Keroletswe, N. Recent applications of aziridine ring expansion reactions in heterocyclic synthesis. *Arkivoc* **2018**, i, 50-113.
11. Munyaneza, A.; Kumar, G.; Morobe, I C. Synthesis, Characterization and *in vitro* Biological Activities of Pyrazolylpalladium(II) Complexes towards Selected Strains. *Synthesis and Catalysis: Open Access* **2018**, 3(1), 1-8.

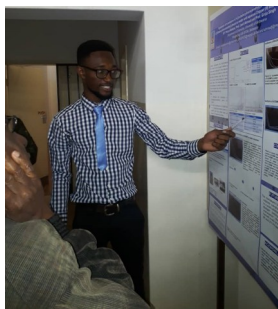
Departmental Seminars

1. Singh, G. S. Green Chemistry in Synthesis of organic compounds with diverse potential. Tuesday March 20, 2018.
2. Ombito, J. O. Phytochemical and Biological Activity Investigation of *Erythrina saculeuxii* and one-pot synthesis of isoflavones. PhD Departmental presentation, Friday, June 1, 2018.
3. Mmereki, B. T. Molecular Structure of 2,2'-difurylmethane: FTIR and ¹H NMR experimental Studies and Density Functional Theory. Monday May 28, 2018.
4. Oyetunji, O. A. Syntheses and reactivity of selected transition metal complexes with nitrogen-based ligands. Monday May 28, 2018.
5. Sichilongo, K. Sulfonamides-Ultraviolet-visible (UV-Vis) detection versus Mass spectrometric detection: A contrast. Monday May 28, 2018.
6. Takuwa, D. T. Comparative HPLC study of isomers of N,N'-2,3-butylenedis(trifluoroacetylacetoniminato)copper (II) and Palladium (II) chelates using silica-based and Zirconia-based stationary phase. Monday May 28, 2018.

Chemistry Students Highlights and News

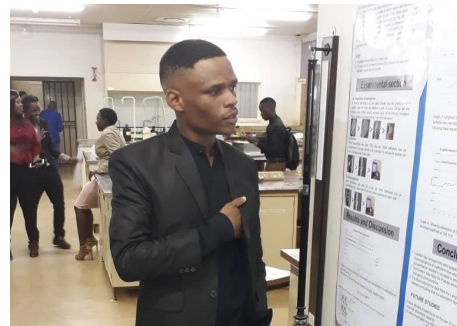
CHE452 RESEARCH PROJECT STUDENTS 2018 PRESENTATIONS

The level 400 Research project students presented the results of their projects as posters on May 9, 2018. The posters were of high quality and the students' presentations were judged to be of acceptable standard. The lack of equipment however adversely affected the quality of the results that were presented.



The twenty eight (28) students who presented the results of their research projects were;

1. **John Joana Ndlovu**. Determination of essential elements in traditional Herbal teas. *Supervisor: Dr Takuwa*.
2. **Kago Selabe**. Determination of vitamins in traditional herbal teas. *Supervisor: Dr Takuwa*.
3. **Mompoloki Molwantwa**. Comparison of physical-chemical characteristics of a honey from Gaborone. *Supervisor: Chinyama*.
4. **John Kabelo Rammala**. Fractionation of Fe, Mg and Ca in Moringa Oleifera Leaves. *Supervisor: Dr Obuseng*.
5. **Khowe Kago Onameditse**. Comparison of the Extraction Efficiency of DLLME Quechers and SPE of efavirenz from Urine/Saliva of sterilized Human Blood plasma. *Supervisor: Prof Sichilongo*.
6. **Odirile Gabanapelo**. Comparison of Extraction Efficiency of DLLME Quechers and SPE. *Supervisor: Prof Sichilongo*.
7. **Basiame Clever**. Comparison of GC-MS and LC-MS analytical performance Characteristics of Carbonyl Compounds in water. Supervisor: *Prof Sichilongo*.
8. **Oreeditse Kalantle**. Physico-Chemical Studies of Ruthenium Metal Complexes. *Supervisor: Dr Mapolelo*
9. **Tebogo Moteu**. Synthesis of Ferrocenyl Isoxazolen complexes of Cu(II) and DNA Binding Studies. *Supervisor: Dr Nareetsile*
10. **Botumile Anthony**. Synthesis of Ferrocenyl pyrazoline complexes of Cu(II) and DNA binding studies. *Supervisor: Dr Nareetsile*
11. **B. M. Mosimane**. Synthesis of 4—electron alkyne complexes of Molybdenum. *Supervisor: Dr Tshabang*
12. **Thata Mathumo**. Comparison and Characterisation of Ruthenium and Cobalt complexes in Combating Cancer. *Supervisor: Dr Nnyepi*
13. **Nigel Phiwani Ndiweni**. BF₃-mediated Demethylation and acylation of Ethers. *Supervisor: Prof Masesane*
14. **Kenanao Chiwe**. Preparation, characterization and application of acid activated Nano coal. *Supervisor: Dr Nadiye*
15. **Waatla Phineaus Marigane**. Preparation, characterization and activation of Lobatse Clay nanoparticles, and study of adsorption of methylene blue. *Supervisor: Dr Nadiye*
16. **Kelebemang Moronga**. Simulation of a Bi-molecular surface reaction of the type A+ B →Products. *Supervisor: Dr Nadiye*



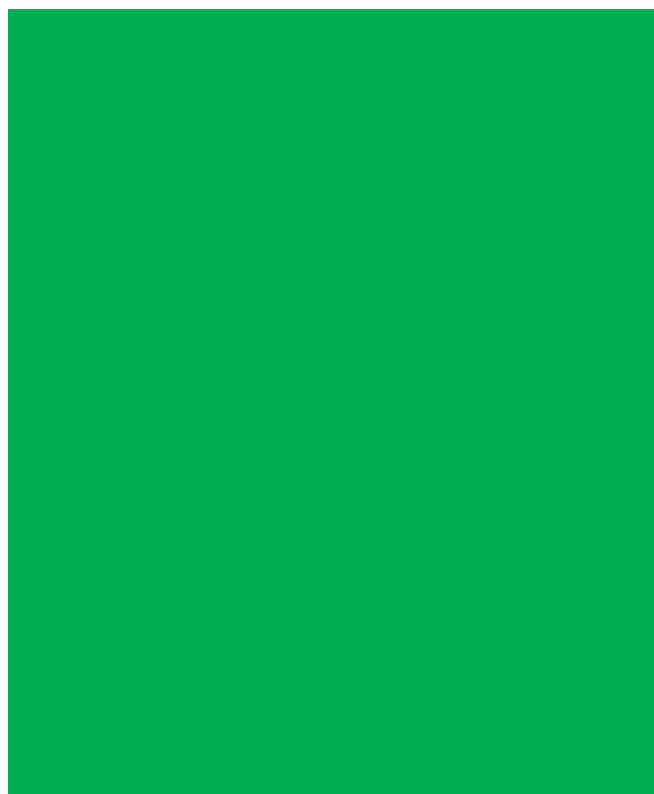
Chemistry Students Highlights and News

17. **Segametsi Adonai Chaloba**. Preparation, Characterization and use of Nano acid activated Makoro Clay. *Supervisor: Dr Nadiye*
18. **Shalom Eigbe**. Intermolecular Interaction Studies. *Supervisor: Dr Ddamba*
19. **Ncube Basadi emmah**. Study of the kinetics of polyaniline-Gold composite. *Supervisor: Dr Kabomo*
20. **Johanna Mokgadi**. Determination of the characteristics of a local seed oil, Bambara groundnuts (*Vigna sabterrenea*): a comparative study of classical and spectroscopic methods. *Supervisor: Prof Yeboah*
21. **Tendai Moses Chigwuo**. Comparative Extraction Processes for *Moringa oleifera* seed proteins used in water purification. *Supervisor: Dr Nkoane and Inonge Chibua*.
22. **Boikanyo Motlhaedi**. Effectiveness of using *Moringa oleifera* seed proteins in the removal of heavy metals from raw water. *Supervisor: Dr Nkoane*
23. **Thamage Nonofu**. Effectiveness of *Moringa oleifera* seed protein in Heavy metal removal in raw water compared to synthetic coagulant used by WUC. *Supervisor: Dr Nkoane*
24. **Olerato Bonyongo**. Characterization of *Moringa oleifera* seed proteins using HPLC. *Supervisor: Mrs Chibua*.
25. **Bokang Ditshupo**. Redox reaction between Ru(terpy)(bipy)Cl₂ and Co(NH₃)₅N₃Cl₂. *Supervisor: Prof Oyetunji*
26. **Tibo Uyapo**. Phytochemical analysis and determination of vitamins in three indigenous traditional leafy vegetables. *Supervisor: Dr Bojase Moleta*
27. **Prince Mokete**. Hysteresis of monolayers of 4-[(octadecylimino)methyl]phenol on water and aqueous CuSO₄ sub-phase. *Supervisor: Prof Ahmad and Prof Singh*



The CHE452 Coordinator Dr Nareetsile and two of the CHE452 students

28. **Baoketsi Thapelo**. Investigation of excess partial molar volumes of morama seed in C₆-C₉ n-alkanes. *Supervisor: Dr Ddamba*



Chemistry Students Highlights and News

The Best 2017-2018 level 300 student Suping Baikabi awarded a certificate and a prize

The best level 300 chemistry student award for the academic year 2017-2018 was scooped by Suping Baikabi. The award is given to student who registers for the eight level 300 taught courses (CHE311, CHE321, CHE331, CHE341, CHE312, CHE322, CHE332 and CHE342) in the same academic year and achieves the highest average grade of these courses.

Suping Baikabi received a certificate and a monetary prize during a CHE421 lecture on Monday 10 September 2018 in front of his class mates. This is the third year in a row that the best level 300 student award was presented. *ChemNews* wishes Suping and all the level 400 students a productive final year of their studies.



DEPARTMENT OF CHEMISTRY

Scholar award

This is to certify that

SUPING BAIKABI

Has been awarded a prize as the level 300 Chemistry major student who demonstrated outstanding academic performance for the academic year 2017-2018


Head, Department of Chemistry



The HoD, Suping and Dr Mapolelo



Dr Mapolelo giving the certificate to Suping Baikabi



Suping and some of his CHE421 classmates

WELL DONE THE LEVEL 300 BEST STUDENT OF 2017-2018!

Chemistry students Highlights and News

Japheth Ombito successfully defends his PhD thesis

Japheth Ombito successfully defended his PhD thesis on Monday 10 September 2018. Japheth started his PhD in October 2015 under the supervision of Prof Majinda, Prof Masesane and Dr Bojase. The title of his thesis is 'phytochemical and biological activity investigation of *Erythrina saculeuxii* and one-pot synthesis of isoflavane.



From left to right: Prof Masesane, Dr Bojase, Ombito, Prof Rashid (external examiner), Prof Majinda and Prof Singh (Internal Examiner)

The external examiner for Ombito's oral examination was Prof Md. Abdur Rashid from Bangladesh and the internal examiner was Prof Singh. *ChemNews* congratulates the new addition to the Department's PhD alumni and wishes him success in his future exploits.

Eniah Lemogang Moshoeshoe Successfully defends her MPhil thesis

Eniah Lemogang Moshoeshoe successfully defended her MPhil thesis on 15 February 2018. Eniah was supervised by Prof Yeboah and the title of her MPhil thesis was 'Comprehensive characterization and stability studies of morama bean oil and other conventional edible oils from Botswana.'

The external examiner for Eniah's thesis was Prof Ishmail Hussein of the University of Gezira, Sudan and the internal examiner was Prof Majinda. *ChemNews* wishes Eniah

the best in her future endeavors.



Moshoeshoe and her supervisor Prof Yeboah



Moshoeshoe, Prof Singh and Prof Majinda

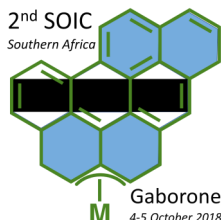
General and staff highlights/News

The Department to host the 2nd Symposium on Organic and inorganic Chemistry Southern Africa

The Department will host the 2nd Symposium on Organic and inorganic Chemistry at the UB conference Centre on October 4-5, 2018. The theme of the symposium is 'to present the forefront of organic and inorganic chemistry by invited international lectures and southern African emerging scientists in the area.'

Plenary Speakers will include Prof Omar Yaghi, University of California – Berkeley, USA, Javier Garcia Martinez, University of Alicante, Spain, Susan Bourne, University of Cape Town, South Africa and James Darkwa, Botswana Institute for Technology Research and Innovation, Botswana. A total of twelve invited speakers mainly from southern Africa will also present their research results at this symposium.

Dr T. T. Mokoena retires from the service of the University of Botswana



Dr Mokoena, a physical chemistry Senior Lecturer retired from the University of Botswana on July 31, 2018 after serving the University since January 1976. During the 42 years he was at UB, Dr Mokoena served as the Head of the Department of Chemistry, the Dean of the Faculty of Science, Coordinator of the Medical Education Programme and the acting Dean of Faculty of Health Sciences.

ChemNews wishes Dr Mokoena a well deserved rest.

2nd Symposium on Organic and Inorganic Chemistry Southern Africa

4-5 October, University of Botswana Conference Centre, Gaborone, Botswana



Plenary

Omar Yaghi
Harvesting Water from Desert Air
Javier Garcia Martinez
The Chemistry Entrepreneur
Susan Bourne
Dynamic Frameworks
James Darkwa
Olefin Transformation Catalysts



Invited

Lidia Armelao, Daniel Rabinovich, Gift Mehlana, Thomas Walczyk, Never Tshabang, Mayoro Diop, Markku Leskelä, Nina Kann, G. Banothile Makhubela, Bojase Moleta, Milan Drabik, Emmanuel N. Nfor, Henrik Sundén, Nicholas Musyoka



https://www.chalmers.se/en/conference/Organic_Inorganic_Chemistry/

With:
* A Philatelic Tour of Chemistry in Africa
* IUPAC Periodic Table of Young Chemist Award



Prof Yeboah and Dr Mokoena

Visit the Department of chemistry facebook page @ www.facebook.com/ubchemistry for more news.

Department Management Structure

Head of Department	Coordinator(Analytical)	Coordinator(Inorganic)	Coordinator(Organic)	Coordinator(Physical)
Prof Masesane 237/211	Dr Takuwa 237/226	Dr Mapolelo 237/239	Dr Bojase 237/229	Dr Mmereki 237/256
Tel No. (267)3552492	Tel No. (267) 3552500	Tel No. (267) 3552482	Tel No. (267) 3552502	Tel No. (267) 3554534
Chief Technician: Mr R Tlhong 237/032 Tel No. (267) 3552506				