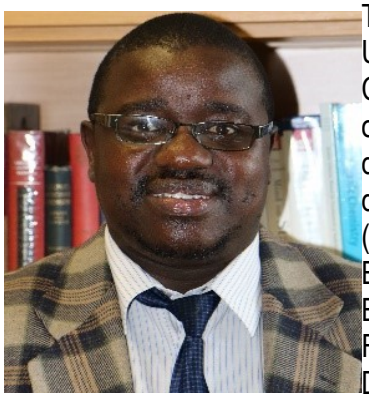
Faculty of Science

News

Chemistry Department Newsletter

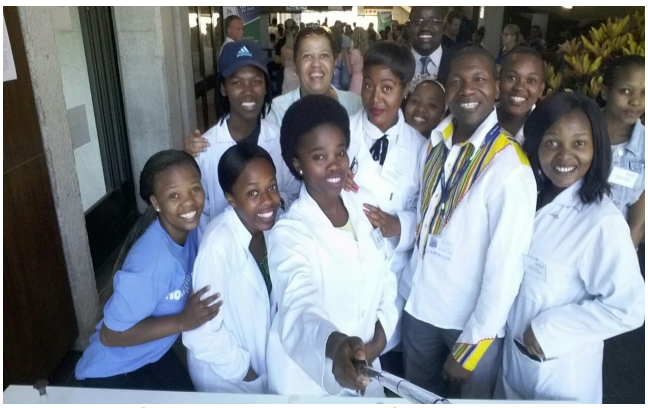
FOREWORD FROM THE HOD (Prof. Z.R. Tshentu)



The Nelson Mandela University (NMU) Chemistry Department offers chemistry for a diverse range of qualifications, namely, BSc (with Chemistry Major), BSc Hons (Chemistry), BSc Honours in Formulation Science, Diploma in Analytical Chemistry, Advanced Diploma in Analytical Chemistry, Diploma in Polymer Technology, Diploma in Chemical Process Technology, MSc (Chemistry), MSc (Industrial Chemistry), MSc Nanoscience and PhD (Chemistry). We also offer service modules to the following departments/ faculties; (i) Pharmacy, (ii) Medical Laboratory Sciences, (iii) Nursing Science, (iv) Emergency Medical Care, (v) Environmental Health, (vi) Dietetics, and (vii) Education.

The Department has a wide range of equipment that it has available for teaching and research, including 400MHz NMR, GC-MS, GC-FID, EPR, AAS, ICP-OES, SC-XRD and PXRD, HPLC, ATR-FTIR, TG, TG-MS, DSC, UV-Vis and Fluorescence Spectrometers as well a TAMIII Calorimeter. We had more than 70 registered M and D students across a range of postgraduate qualifications in fundamental and applied chemistry between the department and associated institutes and centres. The department published 35 full articles in 2017, 6 book chapters and 3 books as well as many structure communications. The department graduated 1 MTech, 10 MSc, 1 DTech and 8 PhD students in 2017. Please look out for the launch of the book by Prof Peter Loyson on "The first Chemistry Department in Port Elizabeth" on page 14. We are also proud to be associated with InnoVenton, Centre for Rubber Science and Technology (CRST), uYilo, CSIR (PE) and a DST-NRF Research Chair in Microfluidic Bio-chemical Processing which is headed by Prof Paul Watts.

NB: For further information, please visit the department website (www.mandela.ac.za/chem)



The Dean of Science Faculty, Prof Azwinndini Muronga, HOD Chemistry, Prof Zenixole Tshentu and Ms Anita Noah (Lecturer) welcomed new students into the Chemistry Department on Thursday 2 February 2017.

Open Day Chemistry & National Science Week at Nelson Mandela University

Departmental and Faculty Meet and Greet.

The Executive Dean of Science Prof. Azwinndini Muronga, HOD Chemistry, Prof Zenixole Tshentu and Ms Anita Noah welcomed new students in 2017.

Ms Anita Noah addressing some of the analytical chemistry new students (2017) at D101, North campus.

The Executive Dean of Science Prof. Azwinndini Muronga, HOD Chemistry, Prof. Zenixole Tshentu and Ms Anita Noah having a photo shot with some of the students.

The HOD Chemistry, Prof. Zenixole Tshentu new students in 2017.

Open Day Chemistry Stall (06 - 07 May 2017) by Dr Gletwyn Rubidge

A big thanks to all who assisted in Open Day 2017. In the chaos of last week prep for open day was a challenge, somehow, I got the basics in place then backed off and let the students work their creativity. They got all excited and motivated and put in a lot of personal effort and time, quite a lot behind the scenes and after hours.

On the contact days, the polymer and analytical diploma students were highly interactive showing a wide variety of chemical reactions, apparatus and instruments. The theme was something about "lighting your inner fire", it was deliberately misinterpreted as evidenced by the numerous controlled explosions and combustions. I was impressed by the seemingly endless enthusiasm and energy of those who helped. The analytical team featured Amanda Ndogeni, Cecile Witbooi, Mzukisi Mdingi, and Monicia Damons.

As chemists, we have certain advantage in being able to show amazing reactions (other than the fiery ones). Colour changes featured in some magic writing with solutions that looked like just water, but bright colours followed the brushes around paper, fake bleeding (iron thiocyante), blue bottle etc.

IST students showing high school students some fascinating chemistry.

The polymer technology section had a few stunning activities including making a bouncing ball and a foam mushroom and their section of the stall was active much of the time. A big thanks to Sihle and Dr Phiri, and to Fanus who helped organise the Polymer. The various stalls get rated and the top three were announced. Our chemistry stall ended up taking second place. Well done to the analytical chemistry and polymer tech in service trainees - you deserved to feature up near the top.

National Science Week at Nelson Mandela University - August 2017

Dr Gletwyn Rubidge detailed the following: National Science Week(NSW) is an annual countrywide celebration of science, technology, engineering, mathematics and innovation (STEMI) led by the Department of Science and Technology(DST) where various stakeholders, role players and interest groups collectively conduct activities that promote general awareness of the value of STEMI to people's daily lives. NSW was initiated in the year 2000 where it was a single event in one province and has since expanded to multiple parallel events in nine provinces.

Objectives of the NSW include:

- Showcasing innovations.
- Popularise Science to the broader SA society.
- Informing citizens of SA's science expertise and geographic advantages (WRT science)
- Make STEMI appealing to learners, such that they may consider science engineering or technology as a career.

Since 2014, the Chemistry Department of NMU has been active in National Science Week activities. Activities normally included a workshop for teachers, science demonstrations for learners and occasionally an interactive chemistry stall for public. Typical direct reach would be to approximately 300 learners and 20 educators. This year saw the Chemistry department of Nelson Mandela University expand that direct reach beyond tenfold to 4000 plus.

The National Science Week of 2017 was hosted by the Science Faculty of the Nelson Mandela University at the Missionvale Campus situated in the northern areas of Port Elizabeth and the event was funded by the university and the DST. Extensive preparation was required by the chemistry department to plan activities that took place prior to the launch(June and July), at the launch(5 August) and during the focus week(7-12 August).

Three large tents pitched in the parking lots housed the approximately eighty stalls in which various companies and organizations set up their exhibits. Scholars arrived by busloads from various Eastern Cape schools, and from 2-6 pm on Friday afternoon marshals guided groups of about 20 learners at a time from stall to stall. Chemists possess a certain advantage over other disciplines in that they can perform numerous interesting reactions that readily lure curious or idle learners closer for few memorable reactions. Exploiting this advantage, the chemistry personnel performed a variety of interactive demonstrations at the 6x3 m Chemistry stall.

The focus was on making the activities as interactive as possible by having scholars perform reactions after donning PPE. Also on display were cut-open batteries, a *SPECUP* LED-based visible spectrometer and a flame emission photometer.

Also on the Friday afternoon, Prof Zenixole Tshentu gave a radio interview with Mr. Lloyd Sitsheke of *Mhlobo Wenene* talking about the National Science Week. The activities and popularity of the Chemistry stall did not escape the notice of the Morning Live TV crew who requested a chemistry presentation at 7 am on the next morning. At short notice, the Chemistry team responded and moved half the stall to the selected venue. On Friday night, the weather took a turn for the worse with 55 mm of rain falling, complicating matters considerably. Despite the challenges the chemistry team were present before sunrise and two short series of experiments were televised with a few extra demonstrations being performed for a few pyrotechnically inclined young lads.

Video Links

Background chemistry during VC talk: https://youtu.be/3MJS-fF2Y2o

Chancellors talk chemistry activity in the https://youtu.be/3MJS-fF2Y2o

Interview on chemical reactions Dr Rubidge https://youtu.be/8_kbgakvYaM

On the Saturday morning nine Analytical Chemistry and Polymer Technology diploma students manned the stall and assisted with demonstrations. The next activity was a 10-minute chemistry show performed by Dr Gletwyn Rubidge in the indoor sports center. During the on-stage show, a videographer focused his camera closely on the reactions which were projected by video onto two large transmission screens for the audience of ~4000 scholars students, educators and VIPs of the event.

In the interest of appealing to learners senses, a memorable sequence of reactions was performed by Dr Rubidge and four assistants. The demonstration began with methanol combustion in a closed coffee tin (loud report), followed by the generation of CO_2 in a 10 liter transparent plastic vessel (citric acid-bicarbonate) with subsequent volume reduction of the CO_2 by hydroxide (the vessel collapsed when shaken). Thereafter the "elephants toothpaste" reaction was performed on a large plastic sheet (iodide

Formation of polyurethane foam in a cup

-catalysed decomposition of hydrogen peroxide). The show was concluded with "harvesting and ignition of the beard of a dragon" (an impressive fireball produced by nitrated cotton wool).

Scholars viewing polymer and chemistry reactions.

Saturday afternoon the weather had cleared up stalls were visited for a good two to three hours by enthusiastic scholars, the chemistry stall was once again very active.

Sodium emission in a flame tornado been watched by high school learners.

During the next week from 5- 11 August, the "focus week", the Chemistry Department planned various activities, talks and laboratory visits including:

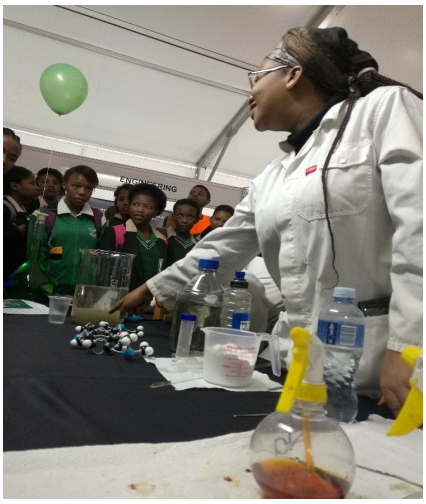
1. Dr B Barton: Crystal growing and instrumentation – a tour of the organic chemistry laboratory.

2. Mr F Gerber: Polymer chemistry reactions and a polymer lab tour.

3. Prof Paul Watts: Microfluidic bio/chemical processing.

4. Prof Zenixole Tshentu and team: Laboratory tour focusing on alternative/ complimentary processes for the elimination of sulfur and nitrogen compounds in fuel.

5. Dr G Rubidge: Chemistry workshop / demonstration for two groups of 60 scholars each; grade 5-7, grade 10-12 scholars at Nelson Mandela Bay Science Center in Uitenhague.



Water clarification with poly aluminium chloride

Scholars feeling the cold – passing around test tubes with freshly mixed ammonium nitrate & water.

The enthusiastic scholars took notes as we covered various topics.

Early Spring Engagement Activities

The North campus engagement team trained four staff of the Nelson Mandela Bay Science Centre in a 15 engagement experiments on 4 September, and on 5 September they had practical application of their new skills with a group of ~80 grade nine scholars from Mzontsundu Secondary School in Ibhayi. This was a joint venture with the Al Fidaa Foundation.

Bring a Learner to the Lab Initiative" Keith Nare

We had a group of 25 Grade 12 Physical Science learners from Walmer High School in the First-year laboratory in the first floor that went through two practicals. The learners were accompanied by their Physical Science teacher and deputy principal Mr Raymond Mali. Firstly, it was esterification and identification of the smells and lastly halogenation of alkenes to distinguish between an alkene and an alkane. They really enjoyed and had the opportunity to tour the different floors with talks from Puleng Moleko in the Inorganic Chemistry section and Dr Benita Barton in the Organic Chemistry section. I gave them a tour of the Physical Chemistry section.

We intend to continue with the 'Bring a Learner to the Lab' initiative establishing the link between our local high schools and the Department of Chemistry with support of everyone in the Department with ideas as this is part and parcel of shared responsibility and driving the spirit of UBUNTU

Scholars listening to the pre-Prac talk by Mr Keith Nare

Scholars taking notes as the practical was demonstrated by Keith Nare.

Walmer High School Student.

Community Outreach at Khumbulani High School

Scholars taking notes as the practical was demonstrated by Mr Gontse Tigele

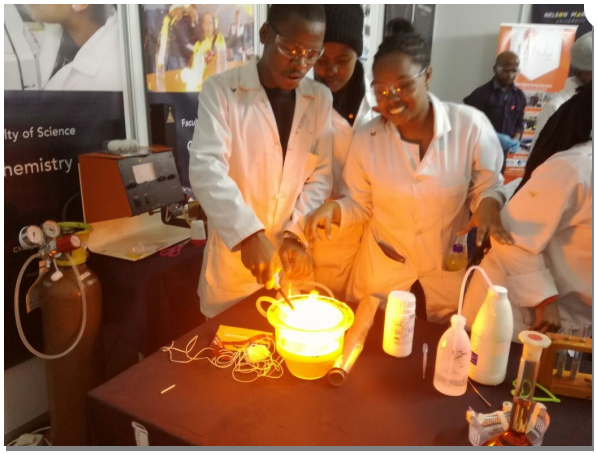
FOR MORE INFORMATION

Contact: Mr Gontse Tigele, Department of Chemistry. Email Address: s215021835@live.mandela.ac.za

More photos from the Nationals Science Week

Mzukisi, Izibele and Asivile (IST) burning gun cotton on Mzukisi's hand.

Tshego, Shadey, Izibele, Asivile, Monicia, Mzukisi and Gareth (IST) and Dr Phiri taking a selfie break at the National Science Week expo



Mzukisi, Sinazo and Shadey carrying out an experiment that generates hydrogen gas for flame test.

Some IST 2017 students alongside Anita, Jacque, Francois and Sam.

Awards

SACI Awards Postgraduates

1. Lize de Jager (MSc student) received a second prize (junior section) at the SACI postgraduate seminars held at Rhode University at the end of October 2017. She presented on "N,N'-Bis(9-phenyl-9-thioxanthenyl) ethylenediamine: Highly Selective Host Behaviour in the Presence of Xylene and Ethylbenzene Guest Mixtures"
2. Ms Kirstin Burger (PhD student) also received a second prize (senior section) at the SACI postgraduate seminars held at Rhodes University at the end of October 2017. She presented on "Synthesis and Characterization of Novel Plasticizer Compounds Derived from Eucalyptus Oil"

Academic Staff

1. Prof Peter Loyson received a Life Membership Award from the South African Chemical Institute. Prof Loyson has been a SACI member for more than 35 years.

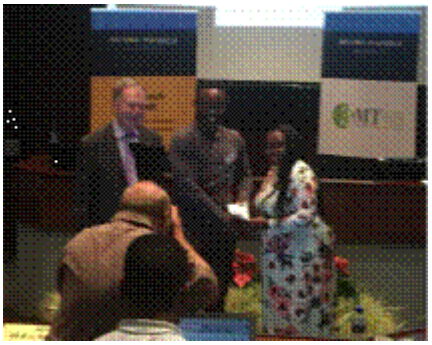
Nelson Mandela University 3MT awards

Some postgraduate students from the department presented in the Nelson Mandela University Inaugural Research Day (3 MT presentations). Nehemiah, Sendi, Puleng and Victor gave the 3 minutes presentations, while Sasha-Lee and Pieter presented posters.

(i) Victor Agbakoba was the 1st runner up in masters students (SET).
(ii) Nehemiah Latolla was the winner amongst doctorate students (SET).
(iii) Nehemiah Latolla also received the people's choice award for the doctorate candidates.

Oral presentations-MSc Category 1st Runner Up

Victor Chike Agbakoba is a MSc. Chemistry candidate (Research) at the Physical Chemistry 'centre for rubber science and technology' (CRST). I delivered a presentation titled; "Carbon Nanotubes: The Final Straw towards Achieving Thinner Stronger and Stretchable Male Latex Condoms?" during the pilot 3MT Research week 2017 competition at the Nelson Mandela University. Where I finished as the 1st runner up in the Science, Engineering and Technology (SET) Masters Category.



Victor Chike Agbakoba receiving his award from Prof Andrew Leitch, DVC research.

Pieter Pohl receiving her award from Prof Blanche Pretorius, RCD research.

Oral presentations-PhD Category Winner

Nehemiah Latolla currently pursuing a PhD (Chemistry) Research in the Science Faculty. I competed in the SET disciplines Doctoral presentation and won it. I was also awarded the people's choice award for best presentation by a doctoral candidate. My presentation title was; "Alkaloidal Elucidation from Cissampelos Capensis the Eastern Cape Medicinal Plant".

Nehemiah Latolla receiving his award from Prof Andrew Leitch, DVC research.

Poster Awards

Sasha Lee Dorfling, a final year PhD student in the Organic Chemistry department. He presented a poster at the NMU Research Week event titled: ""Cyclohexanone-Driven Discriminatory Behaviour Change of Host Compound (+)-(2*R*,3*R*)-TETROL for the Isomeric Methylcyclohexanone Guests". This work was published in Crystal Growth & Design.

Pieter Pohl, is currently finishing his PhD (Chemistry). He presented a poster at the NMU Research Week event titled: "Discrimination Between o-Xylene, m-Xylene, p-Xylene and Ethylbenzene by Host Compound (R,R)-(–)-2,3-Dimethoxy-1,1,4,4-tetraphenylbutane-1,4-diol".

Pieter Pohl receiving his award from Prof Blanche Pretorius, RCD research.

Other Chemistry participants who also received awards

Sendi receiving his award from Prof Andrew Leitch, DVC research.

Pulleng Moleko-Boyce is currently pursuing a PhD (Chemistry) Research in the Science Faculty. Her presentation at the NMU research week event was entitled; "Design and application of metal ion-selective reagents for recovery of precious metals from spent secondary products".

Pulleng Moleko-Boyce receiving her award from Prof Andrew Leitch, DVC research.

Prof Ernst Ferg

Prof Ernst Ferg passed his Black Belt grading in George for OGKK (Okinawa Goju Ryu Karate-do Kyokai) karate on the 9th of December 2017

Departmental Research Outputs

The following research articles, reviews and book chapters were published by staffs and postgraduates in 2017:

Full research articles

1. An investigation of the complexation of host *N,N'*-bis(9-phenyl-9-thioxanthenyl) ethylenediamine with dihaloalkane guests. Benita Barton, Lize de Jager, Eric C. Hosten. *J. Incl. Phenom. Macrocycl. Chem*., 2017. DOI 10.1007/s10847-017-0737-1

2. Mixed Ligand, Palladium(II) and Platinum(II) Complexes of Tertiary DiphosphineswithS-1H Benzo[d] Imidazole-2-yl Benzothioate. Karwan Omer Ali, Hikmat Ali Mohammad, Thomas Gerber and Eric Hosten. *Orien. J. Chem.*, 2017, 33 (2), 584-592. DOI 10.13005/OJC/330205

3. Synthesis and characterization of lanthanide complexes prepared with 2-((E)-(1-hydroxy-2-methylpropan-2-ylimino)methyl)-6-methoxyphenol. Abubak'r Abrahams, Tatenda Madanhire, Eric Hosten & Richard Betz. *J. Coord. Chem.*, 2017, 70 (12), 1994-2014. DOI 10.1080/00958972.2017.1319568

4. Synthesis of Fluorescent Poly (coumarin-triazoles) via a CuAAC 'Click' Reaction. Jean Marie Vianney Ngororabanga, Jaspher Okerio and Neliswa Mama. *S. Afr. J. Chem*., 2017, 70, 89-93. DOI 10.17159/0379-4350/2017/v70a12

5. Synthesis, crystal structure, electrochemical and anti-corrosion studies of Schiff base derived from o-toluidine and ochlorobenzaldehyde. Elias E. Elemike, Damian C. Onwudiwe, Henry U. Nwankwo, Eric C. Hosten. *J. Mol. Struct*., 2017, 1136, 253-262. DOI 10.1016/j.molstruc.2017.01.085

6. Synthesis, crystal structures, quantum chemical studies and corrosion inhibition potentials of 4-(((4-ethylphenyl)imino)methyl) phenol and (E)-4-((naphthalen-2-ylimino) methyl) phenol Schiff bases. Elias E. Elemike, Henry U. Nwankwo, Damian C. Onwudiwe and Eric C. Hosten. *J. Mol. Struct*., 2017, 1147, 252-265. DOI 10.1016/j.molstruc.2017.06.104

7. Synthesis, structures, spectral properties and DFT quantum chemical calculations of (E)-4-(((4-propylphenyl)imino)methyl) phenol and (E)-4-((2-tolylimino)methyl) phenol; their corrosion inhibition studies of mild steel in aqueous HCl. Elias E. Elemike, Henry U. Nwankwo, Damian C. Onwudiwe, Eric C. Hosten. *J. Mol. Struct.,* 2017, 1141, 12-22. DOI 10.1016/j.molstruc.2017.03.071

8 Comparative investigation of the inclusion preferences of optically pure *versus* racemic TADDOL hosts for pyridine and isomeric methylpyridine guests, Benita Barton, Eric C. Hosten and Daniel V. Jooste, *Tetrahedron*, 2017, *73*, 2662-2673.

9. Host proficiency of *N,N'*-bis(9-phenyl-9-thioxanthenyl)ethylenediamine for pyridine and the methylpyridine guests - a competition study Benita Barton, Lize de Jager and Eric C. Hosten, , accepted for publication in *Supramolecular Chemistry*, 2017, DOI: 10.1080/10610278.2017.1361037.

10. Synthesis and characterization of Pr(III), Nd(III) and Er(III) complexes with 2,6-pyridinedimethanol Tatenda Madanhire, Abubak'r Abrahams, Eric Hosten & Richard Betz *J. Coord. Chem*, 2017, 70 (18), 3252

11. Quaternary diammonium groups hosted on polymer microspheres as specific reagents for separation of rhodium(III) and iridium(IV) chlorido species. Avela Majavu, Adeniyi S. Ogunlaja, and Zenixole R. Tshentu. *Separation Science and Technology*, 2017, 52(1), 71-80.

12. Vanadium(IV) catalysed oxidation of organosulfur compounds in heavy fuel oil, Adeniyi S. Ogunlaja, Olalekan S. Alade, Zenixole R. Tshentu, *Comptes Rendus Chimie*, 2017, 20(2), 164-168.

13. Separation of rhodium(III) and iridium(IV) chlorido species by quaternary diammonium centres hosted on silica microparticles. Avela Majavu, and Zenixole R. Tshentu. *South African Journal of Chemical Engineering*, 2017, 24, 82-94.

14. Towards oxidative denitrogenation of fuel oils: vanadium oxide-catalysed oxidation of quinoline and adsorptive removal of quinoline -N-oxide using 2,6-pyridine-polybenzimidazole nanofibers. Adeniyi S. Ogunlaja, Sabiu M. Abdulquadir, Phumelele R. Kleyi, Ernst Ferg, Paul Watts and Zenixole R. Tshentu, *Arabian Journal of Chemistry*, 2017, https://doi.org/10.1016/j.arabjc.2017.05.010.

15. Fluorescent Polymer Incorporating Triazolyl Coumarin Units for Cu2+ Detection via Planarization of Ict-Based Fluorophore, Ngororabanga, J.M.V, Du Plessis, J and Mama, N., *Sensors*, 2017, 17, 1980.

16. An improved synthesis of lamivudine and emtricitabine, D. Mandala and P. Watts, Chemistry Select, 2017, 2, 1102-1105.

17. Semi-continuous multi-step synthesis of lamivudine, D. Mandala, S. Chada and P. Watts, *Org. Biomol. Chem*., 2017, 15, 3444-3454.

18. Synthesis of a key intermediate towards the preparation of Efavirenz using n-butyllithium, S. Chada, D. Mandala and P. Watts, *J. Flow Chem*., 2017, 7, 37-40.

19. Synthesis of amines, carbamates and amides via multi-step continuous flow synthesis, C. R. Sagandira and P. Watts, *European J. Org. Chem.,* 2017, 44, 6554-6565.

20. Flow Processing as a tool for API production in developing economies, R. de Souza and P. Watts, J. Flow Chem., 2017, 7, 146-150.

21. Thermal characterization of tetrabasic lead sulfate used in the lead acid battery technology; E. Ferg, D. Billing and A Venter; *Solid State Sci.* 64 (2017) 13-22

22. An investigation into the temperature phase transitions of synthesized materials with Al and Mg doped lithium manganese oxide spinels by in-situ powder x-ray diffraction; C.D. Snyders, E.E. Ferg and D. Billing; *Powder Diffraction.* 32(1) (2017) 23-30

23. An experimental design approach in formulating a ceramifiable EVA/PDMS composite coating for electric cable insulation; E. Ferg, S. Hlangothi and S. Bambalaza; *Polymer Composites*; 38(2) (2017) 371-380.

24. Tribocorrosion of friction-stir-welded Ti6AL4V in 3.5% NaCl aqueous solution; B. Davoren, E.E. Ferg and D. Hattingh; *Wear*; 390-391 (2017) 246-252

25. *N*,*N*'-Bis(9-phenyl-9-thioxanthenyl) ethylenediamine: Highly Selective Host Behavior in the Presence of Xylene and Ethylbenzene Guest Mixtures, Benita Barton, Mino R. Caira, Lize de Jager, and Eric C. Hosten, *Cryst. Growth Des.*, **2017**, *17* (12), 6660–6667.

26. Cyclohexanone-Driven Discriminatory Behavior Change of Host Compound (+)-(2*R*,3*R*)-TETROL for Isomeric Methylcyclohexanone Guests, Benita Barton, Sasha-Lee Dorfling, and Eric C. Hosten, *Cryst. Growth Des.*, **2017**, *17* (12), pp 6725–6732.

27. Host (–)-(2*R*,3*R*)-2,3-Dimethoxy-1,1,4,4-tetraphenylbutane-1,4-diol and Guests Aniline, *N*-Methylaniline, and *N*,*N*-Dimethylaniline: A Selectivity Study, Benita Barton, Eric C. Hosten and Pieter L. Pohl, *Australian Journal of Chemistry,* doi.org/10.1071/CH17532.

28. Bio-based coatings for reducing water sorption in natural fibre reinforced composites, Thabang Mokhothu, Maya Jacob John, Scientific Reports, doi:10.1038/s41598-017-13859-2, 7:13335, 2017

29. Effect of expandable graphite on thermal and flammability properties of poly(lactic acid)/ poly-ε-caprolactone blend systems" Mfiso Mngomezulu, Rian Luyt, Steve Chapple, Maya Jacob John, *Polym. Eng. Sci.,* 2017

30. Morphology, thermal and dynamic mechanical properties of poly(lactic acid/ expandable graphite (PLA/EG) flame retardant composites, Mfiso Mngomezulu, Rian Luyt, Maya Jacob John, *Journal of Thermoplastic Composite Materials*, DOI: 0892705717744830

31. Flame retardant treated flax fibre reinforced phenolic composites: aging and thermal characteristics, Tshepiso Molaba, Steve Chapple, Maya Jacob John, Fire and Materials *Fire and Materials*. 2018;42:50–58

32. Studies on poly(lactic acid)/ expandable graphite (PLA/EG) flame retardant composites, Mfiso Mngomezulu, Rian Luyt, Steve Chapple, Maya Jacob John, Journal of Renewable Materials 2017 (in press)

33. Bio-based products from xylan: a review, Darrel Naidu, Percy Hlangothi, Maya Jacob John, *Carbohydrate Polymers*, 179, 28-41, 2018

34. Mixed ligand, palladium(II) and platinum (II) complexes of tertiary diphosphineswithS-1H benzo[d] imidazole-2-yl benzothioate, Ali, K.O., Mohammad, H.A., Gerber, T., Hosten, E. *Oriental Journal of Chemistry*, 33(2), 584-592

35. The performance of Pb-acid cells linked to supercapacitors under partial state of capacity cycling conditions; E.E. Ferg and S. Mgangato; *Journal of Energy Storage;* 14 (2017) 49-55

Books/Book chapters

1. Olalekan S. Alade, Kyuro Sasaki, Bayonile Ademodi, Yuichi Sugai, and Adeniyi S. Ogunlaja, Polyvinyl alcohol (PVA) as an emulsifying agent for viscosity reduction of heavy and extra-heavy oils (2017) Heavy Oil: Characteristics, Production and Emerging Technologies, pp. 67-92. Editor: Amir H. Mohammadi ISBN: 978-1-53610-867-5

2. Maya Jacob John, Chapter title, "Bio-based sandwich panels" in Book "Handbook of Composite Materials from Renewable Resources" ISBN: 978-1-119-22365-8, 2017

3. Thabang Mokhothu, Maya Jacob John, Chapter title, "Bio-based fillers for green composites" "Handbook of Composite Materials from Renewable Resources" ISBN: 978-1-119-22362-7 2017

4. Mfiso Mngomezulu and Maya John, Cellulose – Thermoset Nanocomposites – Flammability Studies, Handbook of Nanocellulose and Cellulose Nanocomposites, Wiley Publications ISBN: 978-3-527-33866-5, 2017

5. Sudhakar Muniyasamy, Maya Jacob John, Chapter title, "Biodegradability studies in biopolymers" Handbook of Composite Materials from Renewable Resources" ISBN: 978-1-119-22379-5, 2017

6. Maya Jacob John, Environmental Degradation Behaviour of Biocomposites, Biocomposites for High-Performance Applications, 1st Edition, Current Barriers and Future Needs Towards Industrial Development, ISBN: 9780081007938, 2017

Books

1. Early Pharmacy Teaching in Port Elizabeth, Feb 2017, ISBN 978-1-920508-74-3, self-published.

2. James Moir (1874-1929) Chemist in South Africa, June 2017, ISBN 978-1-920508-79-1, self-published.

3. The First Chemistry Department in Port Elizabeth, November 2017, ISBN 978-1-928357-50-6, African Sun Media, Sun Print, also e-book ISBN 978-1-928357-51-3

Conferences attended, and papers presented

Postgrads

1. D. Mandala and P. Watts, '*An improved synthesis of lamivudine and emtricitabine*, Flow Chemistry Europe 2017, Cambridge, February 7-8 2017.

2. R. Mangwiro and P. Watts, '*INLINE FTIR ANALYZER: An analytical tool for continuous flow chemistry*', Lab Africa, Johannesburg, August 16-17 2017.

3. C. R. Sagandira and P. Watts, '*LAB AUTOMATION IN CHEMICAL SYNTHESIS USING FLOW CHEMISTRY TECHNOLOGY*', Lab Africa, Johannesburg, August 16-17 2017.

4. S. Chada and P. Watts, '*New synthetic route for the preparation of Efavirenz* ', 254th ACS National Meeting & Exposition, Washington DC, August 20-24 2017.

5. K. Burger and P. Watts, 'Synthesis and Characterisation of Bio-Based Acetals Derived from Eucalyptus Oil', SACI Postgraduate Symposium, Rhodes University, October 20 2017.

6. L. Ncanywa and P. Watts, '*A Greener Approach towards the Synthesis of an Antimalarial Drug Lumefantrine*', ICAMCA 2017: 19th International Conference on Advanced Macromolecular Chemistry and Applications, Cape Town, November 2-3 2017.

7. K. Burger, N. Vorster and P. Watts, '*Synthesis and Characterization of Bio-Based Acetals Derived from Eucalyptus Oil*', ICAMCA 2017: 19th International Conference on Advanced Macromolecular Chemistry and Applications, Cape Town, November 2-3 2017.

8. Pulleng Moleko -Boyce and Zenixole Tshentu. Design and application of metal ion selective reagents for recovery of precious metals from spent secondary products. The Southern African Institute of Mining and Metallurgy (SAIMM), 7th international platinum conference in association with advance metal initiative (AMI) Precious metals 2017. 17- 20 October 2017, Polokwane, South Africa. Oral presentation

9. Sasha-Lee Dorfling, Pieter Pohl and Daniel Jooste, all attended the Tetrahedron Symposium in Melbourne in July 2017. They all presented their work on host-guest chemistry.

10. Lize de Jager gave an oral presentation entitled:N,N'-Bis (9-feniel-9-tioxanteniel) etileendiamien: 'n Selektiewe Gasheerverbinding vir Dihalo-alkaangaste at the SAAWK, Suid Afrikaanse Akademie vir Wetenskap en Kuns, held in Pretoria on 3 November 2017.

11. T.O. Dembaremba, A.S. Ogunlaja, Z.R. Tshentu. Investigating oxidovanadium(IV) complexes as potential catalysts for oxidative desulfurization. SACI Inorganic Chemistry Conference 2017, June 2017, Hermanus, South Africa. Oral and poster presentation.

12. T.O. Dembaremba, A.S. Ogunlaja, Z.R. Tshentu. Vanadium(IV)/(V) for the catalytic oxidation of refractory organosulfur compounds. Sasol University Research Seminar 2017, November 2017, Sandton, South Africa. Oral Presentation.

13. Ms Jacolien Du Plessis: Fluorescent triazolyl-coumarin carbon spheres synthesized from waste tyres for Fe^{3+} detection. Applied Nanotechnology and Nanoscience International Conference ANNIC 2017, held in Rome, Italy, 18 – 20 October 2017

14. Cyprian Moyo and Zenixole R Tshentu, Development of palladium selective reagents and materials, 9th international conference of the African Materials Research Society, 11th – 14th December, Gaborone, Botswana. Oral presentation.

Postdocs

F. Odame, Z.R. Tshentu, Benzoyl isothiocyanate derivatives as potential HIV-1 protease inhibitors, Rhodes Centre for Chemico and Biomedicinal Research, June 2017, Grahamstown, South Africa, oral presentation

Academic Staff

C Snyders presented at the DST organised SA International Energy Storage Workshop at Greenway Woods Resort, Mpumalanga; Date: 12-13 October 2017. Strategic workshop that looked at the development of batteries and related technologies in South Africa.

Felix Odame and Zenixole R. Tshentu. Silver (I) and gold(I)-mediated conversion of benzoyl thiourea derivatives to benzamides. SACI Inorganic Chemistry Conference 2017, June 2017, Hermanus, South Africa. Oral presentation.

Adeniyi S Ogunlaja and Zenixole R Tshentu, Oxidovanadium(IV) catalysed oxidation of organosulfur compounds, SACI Inorganic Chemistry Conference 2017, June 2017, Hermanus, South Africa. Oral presentation.

Avela Majavu and Zenixole R. Tshentu**.** Selective reagents hosted on nanofibers for recovery of iridium from platinum group metals, Advanced Metals Initiative (AMI) Precious Metals 2017, October 2017, Polokwane, South Africa. Oral presentation.

Adeniyi S Ogunlaja, Adsorptive desulfurization and denitrogenation of fuel over imprinted polymer microspheres and nanofibers, 9th international conference of the African Material research society, 11th – 14th December, Garborone, Botswana. Oral presentation.

Paul Watts; Keynote Lecture, '*The Use of Continuous Manufacturing to Facilitate Sustainable Synthesis in Emerging Markets*', Flow Chemistry India 2017, Mumbai, India, January 18-19 2017.

Paul Watts: Invited Lecture, '*The use of Microfluidic Reactors for Advanced Synthetic Processing*', Microfluidics, Liquid Handling and LAB-ON-A-CHIP, Mumbai, India, January 18-19 2017.

Paul Watts: Invited Lecture, '*Integrated Continuous Flow Processing of Fine Chemical and Pharmaceutical Products*', CPAC Rome Workshop 2017, Rome, Italy, March 20-22 2017.

Paul Watts: Invited Lecture, '*API synthesis from research to production using continuous flow*', Medicines-for-all symposium, VCU, November 8-9 2017.

E. Ferg; The do's and don'ts in battery research; Topic in pre-conference workshop at 1st Africa Energy Materials Conference (AEM2017); CSIR Pretoria South Africa; March 2017.

E. Ferg; The use of in-situ temperature PXRD to study the phase transitions in battery related materials; Invited speaker at 1st Africa Energy Materials Conference (AEM2017). CSIR Pretoria South Africa; March 2017.

C. Snyders and E. Ferg; Electrochemical Impedance Spectroscopy (EIS) study of doped spinel manganese cathode oxide materials synthesized for Li-ion batteries; 1st Africa Energy Materials Conference (AEM2017). CSIR Pretoria South Africa; March 2017.

C. Snyders; Battery testing facility and the EV platform at NMU; DST supported SA International Energy Storage Workshop; Mpumalanga; October 2017.

E. Ferg; The use of X-rays in battery research; Bruker AXS user meeting; Johannesburg; October 2017.

E. Ferg and N Rust; The use of analytical techniques to study battery chemistry; SA Energy Storage 2017; Johannesburg; November 2017.

N. Rust and E. Ferg; SA Energy Storage 2017; Johannesburg; November 2017.

Emeriti

Prof Peter Loyson

Science for Physics

a) Ancient Timekeeping, 24 March 2017.

b) Galvani and Volta, trailblazers in electricity, 4 August 2017.

c) Galileo, Father of Physics 13 October 2017.

Italian Culture talks

a) Venice: La Serenissima, 21 February.

b) Sicily, melting pot of cultures, 16 May.

c) Verona and Lake Garda: History, Art and Culture, 22 August.

d) Florence and the Medici: 24 October.

Ancient History Society talks

a) Ancient Timekeeping 7 March.

b) Ancient Egyptian Queens, 4 July.

c) Babylonian Mathematics, 3 October.

Historical Society of Port Elizabeth:

Venice, history, Art and Culture, 21 October.

Probus:

Venice: History, Art and Culture 5 September.

GRADUATION 2017

The chemistry department of the Nelson Mandela University made a significant impact in popularizing various aspects and influences of chemistry and highlighted the modern worlds dependence chemistry applied in the sciences, engineering and technology.

National Diploma (Analytical Chemistry) = 35

National Diploma (Polymer Technology) = 10

Diploma in Chemical Process Technology = 23

Bachelor of Technology (Chemistry) = 14

Bachelor of Science (with Chemistry as a major) = 11

Bachelor of Science Honours = 11

MASTER OF SCIENCE (RESEARCH)

BOYCE, Anneme
Title of dissertation: DEVULCANIZATION OF MODEL COMPOUNDS BY A VARIETY OF DIPHENYL DISULFIDES

DAVOREN, Brandon Hilton
Title of dissertation: TRIBOCORROSION PROPERTIES OF FRICTION STIR WELDED AND LASER WELDED TITANIUM ALLOY

JOOSTE, Daniel Victor
Title of dissertation: ASSESSMENT OF THE HOST PROPERTIES OF SELECTED OPTICALLY PURE, RACEMIC AND ACHIRAL COMPOUNDS

MATTHEWS, Cameron – Cum Laude
Title of dissertation: SYNTHESIS, CRYSTAL STRUCTURES AND MOLECULAR MODELLING OF RARE EARTH COMPLEXES WITH BIS(2-PYRIDYLMETHYL)AMINE: AIM TOPOLOGICAL ANALYSIS AND LIGAND CONFORMATION SEARCH

MENTE, Pumza
Title of dissertation: MAIZE STALK FIBRE REINFORCED NATURAL RUBBER/TYRE-TREAD RECLAIMED RUBBER COMPOSITES

MOYO, Mcquillan
Title of dissertation: SYNTHESIS OF L-MENTHYL GLYOXYLATE, AN IMPORTANT INTERMEDIATE IN THE MANUFACTURE OF ARVs, USING FLOW CHEMISTRY TECHNOLOGY

MUKASVANGA, Clibert
Title of dissertation: SYNTHESIS OF FLUORESCENT POLYMERS AND STUDIES OF THEIR POTENTIAL APPLICATIONS AS CHEMOSENSORS FOR METAL IONS

NARE, Keith Dumisani
Title of dissertation: FORMULATION DEVELOPMENT AND THERMORHEOLOGICAL PROPERTIES OF CRUMB RUBBER/EVA MODIFIED BITUMEN

SAGANDIRA, Cloudius Ray – Cum Laude
Title of dissertation: EXPLORING ACYL AZIDES CHEMISTRY IN CONTINUOUS FLOW SYSTEMS
MASTER OF TECHNOLOGY: CHEMISTRY (RESEARCH)

MKWAKWI, Kwakhanya
Title of dissertation: SYNTHESIS AND CHARACTERISATION OF LANTHANIDE COMPLEXES WITH O, O-DONOR LIGANDS: TOWARDS A NEW GENERATION OF HYDROPHOSPHONYLATION CATALYSTS

DOCTORAL DEGREE

DEGREE OF DOCTOR OF PHILOSOPHY (CHEMISTRY)

AKWI, Faith Mary
Title of thesis: SCALABLE CHEMISTRY INVOLVING DIAZO-NIUM SALTS
Supervisor: Prof P Watts

CHADA, Sravanthi
Title of thesis: A NEW SYNTHETIC APPROACH FOR PREPARATION OF EFAVIRENZ
Supervisor: Prof P Watts

NEGLUR, Rekha Raghurama
Title of thesis: PHYSICAL PROPERTIES OF SOLID-STATE ERYTHROMYCIN DERIVED COMPOUNDS
Supervisor: Dr D Grooff

NGORORABANGA, Jean Marie Vianney
Title of thesis: SYNTHESIS AND INVESTIGATION OF THE CHEMOSENSING PROPERTIES OF NOVEL FLUORESCENT TRIAZORYL COUMARIN-BASED POLYMERS
Supervisor: Dr N Mama

ODAME, Felix
Title of thesis: BENZOYL ISOTHIOCYANATES DERIVED LIGANDS AS POTENTIAL HIV-1 PROTEASE INHIBITORS AND THEIR REACTIONS WITH GOLD IONS
Supervisor: Prof ZR Tshentu
Co-supervisors: Prof CL Frost and Dr K Lobb

OKERIO, Jaspher Mosomi
Title of thesis: THE ASSEMBLY OF p-ARYL TRIAZOLE FOLDAMERS INTO DOUBLE AND OTHER SUPER HELICAL STRUCTURES
Supervisor: Dr N Mama
Co-supervisor: Prof B Klumperman

SNYDERS, Charmelle Delray
Title of thesis: AN INVESTIGATION OF THE MORPHOLOGI-CAL AND ELECTROCHEMICAL PROPERTIES OF SPINEL CATHODE OXIDE MATERIALS USED IN LI-ION BATTERIES
Supervisor: Prof EE Ferg

VAN NIEKERK, Xandri
Title of thesis: RHENIUM COMPLEXES OF BENZAZOLE DE-RIVATIVES
Supervisor: Prof TIA Gerber

DOCTOR OF TECHNOLOGY: CHEMISTRY

CHIGONDO, Fidelis
Title of thesis: CONTINUOUS FLOW SYNTHESIS OF SILI-CON COMPOUNDS AS FEEDSTOCK FOR SOLAR-GRADE SILICON PRODUCTION
Supervisor: Prof P Watts
Co-supervisor: Prof B Zeelie

Research centres and Chairs

The Centre for Rubber Science and Technology (CRST)

From the Director: Dr Shanganyane P. Hlangothi

The Centre for Rubber Science and Technology (CRST) draws on Nelson Mandela in chemical rubber science and technology. Its activities include the advancement of rubber related research and development programs across various disciplines such as Chemistry, Environmental Science and Computer Science; training for the needs of the rubber and tyre manufacturing industries within South Africa; and providing analytical and technical services to the South African rubber and tyre manufacturing and recycling industries.

Staff: The centre has a total of 7 staffs (research associates and technician). Staff information could be found on http://crst.mandela.ac.za/Staff-and-Associates

Instruments available: The centre has the following instruments…

- mDSC Q100
- SDT Q600
- ARES G2 Rheometer
- MonTech's Dynamic Rubber Process Analyzer (D-RPA-3000)
- Moving Die Rheometer (MDR-3000 basic)
- Dynamic Mechanical Analysis (DMA Q800),
- Differential Scanning Calorimetry (DSC Discovery series)
- Thermogravimetry coupled with Mass Spectrometry (TG-MS Discovery series).

Recently, a new Thermo Scietific Haake Polylab (modular torque rheometer platform) mixer was installed and commissioned.

For further information, please visit CRST website: http://crst.mandela.ac.za/

InnoVenton: Institute for Chemical Technology

Dr Gary Dugmore Acting Director of InnoVenton

InnoVenton: Institute for Chemical Technology is a formally registered Research Institute at the Nelson Mandela University whose principle research focus is in Product and Process Development. The Institute strives to establish and grow its activities in the areas of services to industries, training and research. The staff and students continue to build on the legacy left to us by InnoVenton's founder, Prof Ben Zeelie.

New Appointments at InnoVenton

- Mr Peter Grant, a formerly from EHL Consulting Engineers, was appointed as a Project Scientist in the Technology Station Activity.
- Mrs Shamimah Balkissoon, formally from The Image Factor, was appointed as InnoVenton's Administrative Assistant and Secretary.
- Mr Mofo Setloboko, formally from the Lesotho police forensic laboratories, was appointed as a Research Analytical Scientist.

A Microalgae Technical Demonstration Facility is housed at InnoVenton and forms the basis for the DST-funded Microalgae-to-Energy Technologies project that includes a Microalgae Technologies Research Centre. The project has achieved significant breakthroughs and world-first in microalgae cultivation and processing with discard coal fines (Coalgae® technology), which have generated a number of patents.

InnoVenton's novel, patented microalgae cultivation system has achieved improved productivities compared to conventional raceway systems, which in turn lowers the cost of production. When microalgae are added to waste coal fines, a superior solid fuel with a renewable biomass fraction, called Coalgae® can be derived. Independent tests have demonstrated its improved performance over the native coal in combustion systems. Coalgae® can be further processed to yield a low-smoke household fuel, as well as liquid fuels (e.g. diesel and aviation fuel).

Several other technologies are being explored, with the research, development and commercialization focused on three broad themes, namely (1) microalgae cultivation, (2) renewable energies, and (3) biomass processing. Examples include the use of microalgae as a bio-fertilizer and soil conditioner. The high protein content of microalgae means the product is an attractive animal feed ingredient, and the protein can also be extracted for food applications.

The Downstream Chemicals Technology Station activity is based at InnoVenton, there are two Major Project initiatives at the Station. The first under the DST Theme;

Expanding Geographical Footprint, is the establishment and development of a so-called Agro-Refinery for the latent Cactus Pear industry. The project aims to establish an entire Agro-Refinery concept round the cultivation, harvesting and processing and production of consumer products from all the main components of the cactus pear.

The second is under the DST Theme; Industrial Growth, and comprises of three projects, namely:

- A process to be developed to extract and purify inulin from locally grown chicory root at Chicory South Africa.
- The development of flower preservation techniques and transpiration formulations with local Fynbos plants for Nikwaflora.
- The development of a range of coffee -based beverages using a cold-brew process, develop quality assurance protocols for the cold-brew extract, evaluate methods to improve the shelf -life of the final beverage, and to beneficiate the coffee grounds resulting from the cold-brew process.

The Teaching and Learning activity at InnoVenton has continued to offer our students Formal Training and Short courses which have focused on the needs of local industry. InnoVenton is looking to broaden its base of interaction with the University's academic community by offering opportunities for University promoters to supervise and co-supervise some of the Post Graduate Research Students who are working on projects linked to our research themes.

For further information please go to: http://innoventondcts.mandela.ac.za/

The uYilo e-Mobility Technology Innovation Programme (EMTIP)

Prof Ernst Ferg (Director of uYilo, Nelson Mandela University)

Involvement of Prof E. Ferg, Dr N Rust, Dr C Snyders and Ms N Erasmus part of uYilo in Chemistry for 2017. Many of the activities and services provided by uYilo can be accessed on their web page. http://uyilo.org.za/

The Technology Innovation Agency (TIA) continued to fund and support uYilo, the Electric Vehicle (EV) platform located at the Nelson Mandela University for 2017. A large emphasis was on the expansion of the national business strategy and the battery research and validation facility. Prof Ernst Ferg continued in his role as research and technical advisor to the group with the appointment of Dr Charmelle Snyders as research assistant. With the help from Ms Natasha Erasmus, Dr Charmelle Snyders role was to oversee the materials testing and characterisation facility that is located in the physical chemistry laboratories in building 13 on south campus.

She also helped to oversee the diploma students that were appointed as interns to complete their in-service-training in analytical chemistry. She is also co-supervisor of a master's level project in the field of Li-ion battery materials (Charmaine Gelant "*The morphological and electrochemical investigation of sol-gel synthesized doped spinel $Li_4Ti_5O_{12}$ used as anode material in Li-ion batteries*")

Her involvement was also in helping with some of the academic lecturing duties, where for the first time this year, she presented the module "Material Chemical Analysis" to the new "Advanced Diploma in Analytical Chemistry" students. The focus of module was in the use of physical analytical techniques to study various properties of materials. A part of the students' practical component was for them to spend a day in two local industries that deal with the manufacturing of powders. They were then required to further analyse the manufactured materials for their various physical properties in the laboratories at the university. The programme aims at exposing students to a more "hand-on" experience of working with various analytical equipment in a typical laboratory.

The uYilo group continued to support the uptake of final year diploma students that worked in the analytical laboratories. These students would receive the experience of working within an accredited laboratory quality system and become proficient in a range of techniques and equipment. They would also have to interact with various industry based customers and other research students. In addition, the students would have the opportunity to work on a small research project relevant to the field of materials analysis and electrochemistry.

The students were:

Gavin Constance works primarily in the battery-testing laboratory. His research project is to look at the standardization of the lead acid battery single plate testing and validation.

Sanushka Pillay works primarily in the materials testing laboratory. Her research project looks at using electrochemical techniques to determine chlorides in acid.

Floyd Ngobeni works primarily in the material testing laboratory. His research project is to determine the correlation between the coefficient of friction as determined by tribology, and the surface finish of various plastic and rubber materials.

Some of the highlights of the battery group in uYilo and the chemistry department was the visit of Shmuel De-Leon. He hosted a two-day Energy Storage Seminar (Batteries, Fuel Cells, Super Capacitors and EV) in the 19th and 20th of July 2017 in Port Elizabeth. Shmuel De-Leon is a leading international expert in Energy Storage with over 20 years' experience within the field.

The attendees of about 50 people ranged from national government stakeholder agencies, industry, academia and businesses that included Eskom, CSIR, Volkswagen SA, First National Batteries and Auto-X (Willard). The event also provided networking and business opportunities for all attendees.

The battery testing section of the group successfully passed the 12-month follow-up assessment by SANAS that allows the group to continue with accredited testing of Pb-acid batteries under the SANAS logo for the next three years. Natasha Erasmus has taken over the responsibilities of a quality manager within the eNtsa/uYilo group where she maintains and ensures compliance to the quality system for the various technical groups located across the two campuses. The laboratory has also submitted documents for the accreditation of Li-ion cell testing. This would be the validation of cells according to IEC62620 – Secondary Lithium-ion cell and batteries for use in stationary applications. This will allow companies to have batteries and cells tested that then comply with international specifications. The picture is of a Weiss environmental chamber that is required when testing Li-ion cells.

In August 2017, Prof Ferg and Dr Rust attended an IDC Launch of the US Trade and Development Agency sponsored South African Energy Storage Techno-Economic study. The study was done over two years and sketched the energy storage "landscape" in South Africa. The 542-page document was made available to the public and highlighted the need and the focus areas of energy storage in South Africa until 2024. It sketches the role of batteries and related materials in the South African context and what role the battery group would have going forward. A link to the document is available on http://www.energystorage.co.za/south-africa-energy-storage-technology-market-assessment-report-released/

You might have seen some of the Electric Vehicles (EV) driving around campus and in Port Elizabeth. (**BMW i3 busy charging at the live testing facility & Branded Nisan Leaf**).

The uYilo group had acquired another Nissan Leaf and a BMW i3 to complement the EVs available for field-testing by research students from the engineering and IT department. The projects focus is on the acquisition of large vehicle tracking data and development of suitable user driver models for optimizing the driving experience of EV.

The use of the vehicles also allows the study of an integrated energy approach to charging them using renewable energy, second-life EV batteries and the supporting of peak grid-electricity. This is done through the live-testing environment located next to the new engineering building on north campus. The future prospects of e-Mobility related technologies are expanding at a significant rate both locally and globally. A good summary of the global outlook of the EV related emerging technologies can be obtained from a publication from the International Energy Agency (IEA) that is available on their web page. http://www.iea.org/publications/freepublications/publication/GlobalEVOutlook2017.pdf

The materials and battery facility also acquired two new pieces of research equipment. These include a Micromeretics Tristar BET surface area analyser (R500k) and a 2-channel high rate Start-Stop battery tester (R500k). BET surface area analysis is one of many physical chemistry properties that is of importance when studying battery related materials. The TriStar BET surface area analyser that is equipped to analyse three samples at the same time.

Research Chair: Microfluidic Biochemical Processing

Prof Paul Watts (Research chair)

Professor Watts research aim to develop a continuous flow methodology to investigate how small production platforms can enhance chemical manufacture within the South African economy. In addition, research will be undertaken to investigate the integration of synthesis and purification within continuous flow systems. Research interests include:

- Micro reactor and continuous flow synthesis;
- Green chemistry;
- Process intensification and process analytical technology;
- Pharmaceutical manufacture;
- Catalysis (and biocatalysis) in continuous flow reactors;
- Drug formulation;
- Nanochemistry.

For further information, please go to: http://research.mandela.ac.za/Research-Chairs/Chair-in-Micro-fluidic-Bio-Chemical-Processing

APPOINTMENTS

Miss Zimkitha Dyan joined the chemistry department as the departmental Secretary. Prior to joining the department, she was worked with different departments within the university, some of which are; (i) Financial Aid Office, as student assistant, (ii) Environmental Health department as the department's assistant secretary and lastly (iii) Research Capacity Development department as the Administrative Officer. Miss Zimkitha holds a BTech degree in Management Science.

South African National Roads Agency SOC Ltd (SANRAL) appoints first research associate

The recent addition to the staff complement at the South African National Roads Agency SOC Ltd (SANRAL) is a doctoral candidate who also volunteers as a maths and science and homework club mentor.

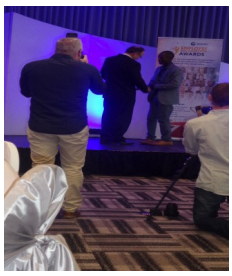
Keith Nare, a PhD candidate at Nelson Mandela University (NMU) is pursuing his doctorate in physical and polymer chemistry and was appointed the research associate at SANRAL's materials lab in Port Elizabeth, Eastern Cape. Nare has a BSc (Biochemistry and Chemistry), Bsc Honors (Chemistry), MSc (Physical and Polymer Chemistry) all from the Nelson Mandela University.

Nare's relationship with SANRAL started while still working as a visiting student at the SANRAL Training Academy for Candidate Engineers since last year. He officially joined the lab on January 10, 2017.

Nare's position at SANRAL involves Rheological testing which is a highly specialised testing using high end testing equipment of which there is only a handful of in the country.

http://www.rnews.co.za/article/13548/sanral-southern-region-appoints-first-research-associate

Alumni



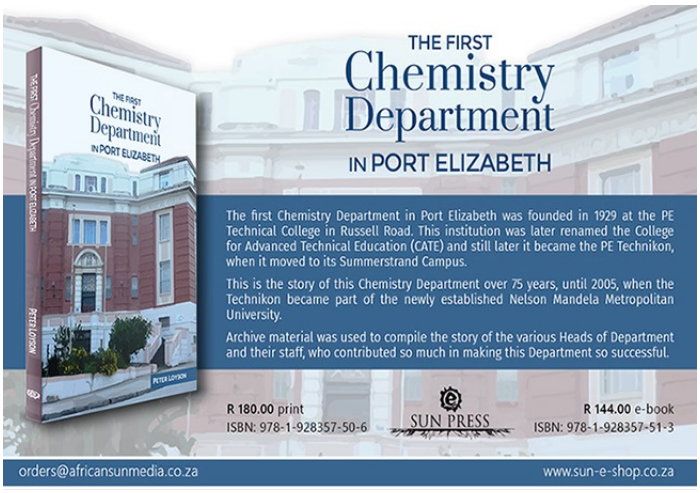
Mr Masixole Swartbooi

He works at Aspen Pharmacare as a laboratory analyst and recently won the Aspen recognition community award. He was recognized for teaching young pupils in the location Mathematics and Physical Sciences particularly at junior phases (Grade 8, 9 and 10).

Book Lunch by Prof P Loyson

Prof Loyson wrote a book on "The First Chemistry Department in Port Elizabeth" which has its origins in Russell Road. This department ended up in Summerstrand at the former PE Technikon, and is now a part of NMU Chemistry Department. Below are some of the photos from the book lunch.

Peter Loyson matriculated in Belgium in classical languages in 1965 and moved with his family to South Africa. In Port Elizabeth he was employed by General Motors, where he worked in the Chemistry Laboratories as a chemical technician. Whilst employed there for 7 years, he studied part-time at the PE College for Advanced Technical Education for the CTD Diploma (Chemical Technician's Diploma) after which he completed his BSc Degree through UNISA, majoring in Chemistry and Physics.



Further qualifications followed at the then University of Port Elizabeth ending up with a Doctorate in Chemistry in 1980, whilst lecturing physical and analytical chemistry part-time at the PE Technikon in the Pharmacy and Applied Science Departments. He became Head of Chemistry in 1980, a position he held for 15 years, after which he was appointed Professor in Chemistry. After the merging of the PE Technikon with the University of Port Elizabeth (UPE) he became Professor of Analytical and Physical Chemistry at the newly established
Nelson Mandela Metropolitan University. He lectured electroanalytical chemistry, kinetics, thermodynamics and an introduction to chemical engineering. His main research focus was organic electrochemical synthesis and chemical education. He retired in 2011, when he was awarded the South African Chemical Institutes' prestigious Chemical Education Medal.

Peter Loyson has always been interested in history. In 2008 he was instrumental in founding the Ancient History Society of Port Elizabeth, a Society which has grown tremendously over the years. He has a strong interest in the history of chemistry and Science in general and has given talks on Chemistry in Ancient Egypt, Science and Technology in Ancient China, A tribute to the Ancient Greeks, Ancient Greek Mathematics, Ancient Roman Engineering, The Golden Age of Arabic Science, Ancient Timekeeping and others.

Prof. P. Loyson giving a talk on the history of the First Chemistry Department in Port Elizabeth.

Prof. C. McCleland giving the vote of thanks and a brief history of South Campus (former

From L-R; Mr Ray Venter and Dr Buyiswa Hlangothi .

Prof P. Loyson, Prof. Hennie Snyman (former Rector of PE Technikon) with his wife.

From L-R; Prof. ZR Tshentu, Prof. Derek Sherwood (former Director of School of Applied Science at the former PE Technikon) with his wife.

Departmental photos

Front Row (L-R): Jordan Slabbert; Matshidiso Makhalema; Tarryn Swartbooi; Charmaine Gelant; Natalie du Plessis; Aidan Battison; Puleng Moleko- Boyce; Cleo Dube; Siyamthanda Masele; Thembela Sonti; Lefika Mosia; Zipporah Madikane.

Second Row (L-R):Cyprian Moyo; Dr Sasha-Lee Dorfling; Daniel Jooste; Cameron Mathews; Phuti Tsipa; Lutho Gxakuma; Lubabalo Ndima; Dr Mpho Phiri; Austine Iroegbu; Selwyn Weitz; Jabulani Gumede.

Third Row (L-R):Pieter Pohl; Eric Bashman; Cynthia Balintulo; Zimkitha Dyan; Lukhanyo Bolo; Khanya Ngobo; Dr Rekha Neglur; Pumza Sobekwa; Dr Felix Odame; Briswell Mabuto; Nehemiah Latolla.

Fourth Row (L-R): Agbakoba Victor; Dr Mohau Phiri; Dr Neliswa Mama; Dr Eric Hosten; Samuel Bosman; Prof Hans Rohwer ; Dr Abubak'r Abrahams; Dr Benita Barton; Dr Kathy Garde; Jacques Thomas; Henk Schalekamp.

Fifth Row (L-R): Dr Adeniyi Ogunlaja; Prof Thomas Gerber; Prof Cedric McCleland; Prof Zenixole Tshentu; Gletwyn Rubidge; Dr James Carson; Dr Colin Southway; Dr Percy Hlangothi; Francois Olivier; Aldritt Maclean

Departmental photos

End of year Function, 2017
























Obituaries

Prof Ben Zeelie dedicated his life to developing his team of staff and students. Encouraging them to take responsibility for each other. He believed in making Science practical and relevant to the public. On a more formal note, he obtained his PhD in Chemistry at the University of Port Elizabeth and paid it forward by acting as promoter/co-promoter for 63 masters and doctorate students, this excludes those he examined and consulted for. Refereed Publications he wrote totaled 27 that we know of and 19 Patents excluding those on Coal Fine Purification, Microalgae Cultivation, Process equipment and Coalgae which were either granted, filed or registered between 2010 and 2015. He contributed to over 50 conference proceedings during his career.

Professor André Goosen was born in Queenstown and matriculated at Queen's College in 1949. He was a member of the Royal Society of Chemistry (London), a Fellow of the Royal Society of South Africa, and a Honorary Life Member of the South African Chemical Institute. He was registered with the South African Council for Natural Scientists. Prof Goosen received an AECI Gold Medal of the South African Chemical Institute in 1975, followed by the Gold Medal in 1992 in recognition of his contribution to chemical education and research on free radical reactions. He was a productive researcher, blessed with excellent practical skills, who authored 80 research papers and supervised 34 MSc and 15 PhD students.

CHEMISTRY NEWSLETTER EDITORIAL TEAM

Thanks to all those who have contributed to making 2017 newsletter a success, we look forward to a fulfilling 2018.

Dear student and staff of the department of chemistry, without your contributions a newsletter is not possible. For this reason, I would like to invite everyone to send contributions to me in good time before the next newsletter. I wish you all a peaceful, happy, healthy, progressive and successful year in 2018. ***Email:*** *adeniyi.ogunlaja@mandela.ac.za*