RHODES UNIVERSITY, MAKHANDA, SOUTH AFRICA

STUDENT INFORMATION

MR FRANCIS CHINDEKA (PART-TIME DOCTORAL STUDENT)
STUDENT NO: 15C0005
SUPERVISOR: DISTINGUISHED PROFESSOR TEBELLO NYOKONG

CONTACT DETAILS:

Rhodes University
Institute for Nanotechnology Innovation
C/O Department of Chemistry
P O Box 94
Makhanda (Grahamstown) 6140, South Africa
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EDUCATION DETAILS:

Rhodes University, Makhanda, South Africa
PhD (Chemistry) currently

Rhodes University, Makhanda, South Africa
MSc (Chemistry) with distinction - 2020

Zimbabwe Institute of Management: Executive Diploma in Business Leadership

- Technical paper, Essay paper, Overall exam and assignments
- Research report/ Thesis

South African Qualifications Authority (SAQA)

- NQF 6 Electrical Engineering (Electronic Systems)
- NQF 5 Further Education Trainer's Certificate in Education

- NQF 4 National Senior Certificate

Apprenticeship Training & Skilled Manpower Development Class 1 (1989 to 1992)

City & Guilds of London Institute (Certificate of Unit Credit) (2001)
Technician Diploma in Telecommunications and Electronics Engineering T3 (Part 2)

Ministry of Higher and Tertiary Education (Harare Polytechnic) (2004)

- Zimbabwe Further Education Trainer's Certificate in Education

Other Training:

Siemens programmable Logic controllers, Wonderware Intouch Basic 9.0 (Supervisory Control and Data Acquisition), Variable speed drives (VSDs), Total production maintenance management, Research design and evaluation of training, Instructional techniques, ISO 9001: 2000 Quality management system development, First aid, Basic laser safety, Hazardous materials controls and management, Elementary firefighting.

EMPLOYMENT HISTORY:

1. Employer: Rhodes University, Chemistry Department (Grahamstown, South Africa)
2010 to current
Position: Principal Technical Officer-Instrumentation (responsible for safety)

Duties & Responsibilities

- Management, supervision and administration of the instrumentation section (staff and resources). Train and manage other staff members/ senior postgraduate students as instrument operators in order to allow for uninterrupted laboratory operation in my absence.
- Routine maintenance, troubleshooting and repair of scientific equipment, which include the XPS spectrometer, XRD diffractometer, Elementar, ToF-SIMs, IR, Raman, UV/ Vis spectrophotometers, Mass-spectrometers, GC, HPLC, TGA and related equipment such as sample preparation equipment, chillers, vacuum pumps and UPS.
- Facilitate rapid equipment repair, and provide advice on cost-effective and time–saving solutions to resolve equipment failure.
- Day-to-day operation of instruments and auxiliary equipment, including sample preparation, data collection & analysis and user assistance. In particular this involves running a scientific service for instruments such as XPS, XRD, ToF-SIMs, Elementar , HPLC and GC. Regulating the use of these departmental and NIC facilities by non-departmental users, and running samples as a service as directed by the HOD in conjunction with the Director of the NIC.
- Monitoring of the laboratory environment including access, safety and security.
- Monitoring of sample and data quality.
- Training of users (researchers, professional scientists, MSc/PhD, post-doctoral fellows) on basic principles and scientific background of analytical methods, analytical options of instruments, calibration of instruments, data documentation, reduction, processing and interpretation.
- Developing, through experience, an understanding of the scientific role of the research equipment used to support various research projects and undergraduate teaching in the Department.
- Maintaining the efficient functioning of both stand-alone computers and computers linked to research equipment.

- Liaising with staff, students, contractors, suppliers of research equipment and service engineers with regards to equipment.
- Developing, maintaining and implementation of the laboratory safety handbook.
- Monitor procurement, use and disposal of chemicals.
- Carry out monthly safety inspections as required by regulations.

2. Employer: Corruseal Corrugated Packaging Group (Wadeville, Gauteng, South Africa)
2008 to 2010
Position: Millwright/Electrician

3. Employer: Nampak Wiegand Glass (Roodekop-South Africa)
2008 to 2008
Position: Process Technician

4. Employer: Ampaglas SA Pty Limited
2007 to 2008
Position: Shift Millwright/ Electrician

5. Employer: Delta Beverages (Harare, Zimbabwe)
2004 to 2007
Position: Technical Training Officer

6. Employer: Technical Assistance and Support Centre (TASC) for the College Information Technology Enhancement Project (CITEP) (Project funded by an NGO and The Ministry of Higher and Tertiary Education) (Harare, Zimbabwe)
2003 to 2004
Position: Facilitator - Technical Assistance and Support Centre

7. Employer: Harare Polytechnic (Ministry of Higher and Tertiary Education) (Harare, Zimbabwe)
2001 to 2003
Position: Senior Lecturer

8. Employer: Zimbabwe Iron and Steel Company (Zisco) (Redcliff)
Positions: 1989 to 2001
Electronics Technician (1993 – 2001)
Apprentice (1989 – 1993)

RESEARCH TITLE/PROJECT:

The utilization of different porphyranoid nanomaterial combinations for dye-sensitized solar cell optimization

PUBLICATIONS:

1. Shumba, Munyaradzi; Centane, Sixolile; **Chindeka, Francis**; Nyokong, Tebello
Nanocomposites of sulphur-nitrogen co-doped graphene oxide nanosheets and cobalt mono carboxyphenoxy phthalocyanines for facile electrocatalysis

Journal of Electroanalytical Chemistry (2017), 791, 36-48
DOI:10.1016/j.jelechem.2017.03.006
http://dx.doi.org/10.1016/j.jelechem.2017.03.006

2. Sivuyisiwe Mapukata, **Francis Chindeka**, Kutloano E. Sekhosana, Tebello Nyokong
Laser induced photodegradation of Orange G using phthalocyanine – cobalt ferrite magnetic nanoparticle conjugates electrospun in polystyrene nanofibers.
Molecular Catalysis Editor's choice paper, 439 (2017) 211-223
DOI:10.1016/j.mcat.2017.06.028
https://doi.org/10.1016/j.mcat.2017.06.028

3. **Francis Chindeka**, Philani Mashazi, Jonathan Britton, Gertrude Fomo, David O. Oluwole, Azole Sindelo, Tebello Nyokong
Optimizing phthalocyanine based dye-sensitized solar cells: The role of reduced graphene oxide
Synthetic Metals 246 (2018) 236–245
DOI: 10.1016/j.synthmet.2018.10.021
https://doi.org/10.1016/j.synthmet.2018.10.021

4. **Chindeka, Francis**; Mashazi, Philani; Britton, Jonathan; Oluwole, David O.; Mapukata, Sivuyisiwe; Nyokong, Tebello
Fabrication of dye-sensitized solar cells based on push-pull asymmetrical substituted zinc and copper phthalocyanines and reduced graphene oxide nanosheets
Journal of Photochemistry and Photobiology, A: Chemistry (2020), 399, 112612 (1-9)
DOI:10.1016/j.jphotochem.2020.112612
https://doi.org/10.1016/j.jphotochem.2020.112612

5. Nyembe, Sanele**; Chindeka, Francis**; Ndlovu, Gebhu; Mkhohlakali, Andile; Nyokong, Tebello; Sikhwivhilu, Lucky
Enhanced Solar Efficiency via Incorporation of Plasmonic Gold Nanostructures in a Titanium Oxide/Eosin Y Dye-Sensitized Solar Cell
Nanomaterials (2022), 12(10), 1715 (1-12)
DOI: 10.3390/nano12101715
https://doi.org/10.3390/nano12101715

6. Isaac Mulaudzi, Lekhetho Mpeta, Refilwe Matshitse, Francis Chindeka and Tebello Nyokong
The effect of reduced graphene oxide and exfoliated graphite on dye sensitized solar cells containing octa carboxylic acid Cu phthalocyanine
Journal of Coordination Chemistry 78, No. 4 (2025) 386–397
DOI: 10.1080/00958972.2024.2442078
https://doi.org/10.1080/00958972.2024.2442078

CONFERENCES/WORKSHOPS:

AUTEX World Textile Conference
29-31 May 2017, Corfu Holiday Palace Hotel, Corfu, Greece
Oral Presentation:
Francis Chindeka, Philani Mashazi, Jonathan Britton and Tebello Nyokong
Design and fabrication of Transparent Conductive Electrodes and Dye-Sensitized Solar Cells (DSSC)

70th Annual Meeting of the International Society of Electrochemistry
4-9 August, Durban International Convention Centre, Durban, South Africa
Poster Presentation:
Francis Chindeka, Philani Mashazi, Jonathan Britton, Gertrude Fomo, David Oluwole, Azole Sindelo and Tebello Nyokong
Optimizing Phthalocyanine Based Dye-Sensitized Solar Cells: the Role of Reduced Graphene Oxide