RHODES UNIVERSITY, GRAHAMSTOWN, SOUTH AFRICA

STUDENT INFORMATION

DR SIXOLILE CENTANE (POSTDOCTORAL FELLOW)
SUPERVISOR: PROFESSOR PHILANI MASHAZI

CONTACT DETAILS:

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EDUCATION DETAILS:

PhD (Chemistry) 2024 - Rhodes University, Grahamstown, South Africa
MSc (Chemistry) 2018 - Rhodes University, Grahamstown, South Africa
BScH (Chemistry) 2015 - Rhodes University, Grahamstown, South Africa
BSc (Chemistry and Environmental Geographic Sciences) 2014 – University of Cape Town, Cape Town, South Africa

RESEARCH TITLE/PROJECT:

Electrochemical sensing using phthalocyanines and graphene quantum dots

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. Sixolile Centane, Ojodomo J. Achadu and Tebello Nyokong
Effects of Substituents on the Electrocatalytic Activity of Cobalt Phthalocyanines when Conjugated to Graphene Quantum Dots
Electroanalysis (2017) 29, 2470–2482
DOI: 10.1002/elan.201700252
http://onlinelibrary.wiley.com/doi/10.1002/elan.201700252/full

3. Centane, Sixolile; Sekhosana, Edward Kutloano; Matshitse, Refilwe; Nyokong, Tebello
Electrocatalytic activity of a push-pull phthalocyanine in the presence of reduced and amino functionalized graphene quantum dots towards the electrooxidation of hydrazine
Journal of Electroanalytical Chemistry (2018), 820, 146-160
DOI:10.1016/j.jelechem.2018.05.005
https://doi.org/10.1016/j.jelechem.2018.05.005

4. Nkhahle, Reitumetse; Sekhosana, Kutloano Edward; Centane, Sixolile; Nyokong, Tebello
Electrocatalytic Activity of Asymmetrical Cobalt Phthalocyanines in the Presence of N Doped Graphene Quantum Dots: The Push-pull Effects of Substituents
Electroanalysis (2019), 31(5), 891-904
DOI:10.1002/elan.201800837
https://doi.org/10.1002/elan.201800837

5. Sixolile Centane, Tebello Nyokong
The antibody assisted detection of HER2 on a cobalt porphyrin binuclear framework and gold functionalized graphene quantum dots modified electrode
Journal of Electroanalytical Chemistry 880 (2021) 114908 (1-12)
DOI: 10.1016/j.jelechem.2020.114908
http://dx.doi.org/10.1016/j.jelechem.2020.114908

6. Sixolile Centane and Tebello Nyokong
Impedimetric aptasensor for HER2 biomarker using graphene quantum dots, polypyrrole and cobalt phthalocyanine modified electrodes
Sensing and Bio-Sensing Research 34 (2021) 100467 (1-10)
DOI: 10.1016/j.sbsr.2021.100467
https://doi.org/10.1016/j.sbsr.2021.100467

7. Sixolile Centane and Tebello Nyokong
Aptamer versus antibody as probes for the impedimetric biosensor for human epidermal growth factor receptor

Journal of Inorganic Biochemistry 230 (2022) 111764 (1-12)
DOI: 10.1016/j.jinorgbio.2022.111764
https://doi.org/10.1016/j.jinorgbio.2022.111764

8. Sixolile Centane, Sithi Mgidlana, Yolande Openda, Tebello Nyokong
Electrochemical detection of human epidermal growth factor receptor 2 using an aptamer on cobalt phthalocyanines – Cerium oxide nanoparticle conjugate
Bioelectrochemistry 146 (2022) 108146 (1-10)
DOI: 10.1016/j.bioelechem.2022.108146
https://doi.org/10.1016/j.bioelechem.2022.108146

9. S. Centane, T. Nyokong
Co phthalocyanine mediated electrochemical detection of the HER2 in the presence of Au and CeO_2 nanoparticles and graphene quantum dots
Bioelectrochemistry 149 (2023) 108301 (1-12)
DOI: 10.1016/j.bioelechem.2022.108301
https://doi.org/10.1016/j.bioelechem.2022.108301

10. Sixolile Centane, Sithi Mgidlana, Yolande Openda, Nobuhle Ndebele, Tebello Nyokong
Effect of symmetry and substituents of cobalt based phthalocyanines in aptasensor design for the electrochemical impedimetric detection of the human epidermal growth factor receptor 2
Journal of Electroanalytical Chemistry 941 (2023) 117524 (1-11)
DOI: 10.1016/j.jelechem.2023.117524
https://doi.org/10.1016/j.jelechem.2023.117524

11. Sixolile Centane, Sithi Mgidlana, Yolande Openda, Tebello Nyokong
Single vs sandwich aptamers: Towards the detection of human epidermal growth factor receptor 2 using composites of phthalocyanine and nanoparticles
Bioelectrochemistry 153 (2023) 108496 (1-14)
DOI: 10.1016/j.bioelechem.2023.108496
https://doi.org/10.1016/j.bioelechem.2023.108496

12. Mbulelo Jokazi , Sixolile Centane , Philani Mashazi , Tebello Nyokong
Photoelectrodegradation and sensing of pentachlorophenol using In and Mn metalated porphyrins in the presence of TiO_2 nanoparticles
Journal of Photochemistry & Photobiology, A: Chemistry 460 (2025) 116118 (1-13)
DOI: 10.1016/j.jphotochem.2024.116118
https://doi.org/10.1016/j.jphotochem.2024.116118

CONFERENCES/WORKSHOPS:

Atlantic Basin Conference on Chemistry
IBEROSTAR Cancún, Cancún, Mexico, 23-26 January 2018
Oral Presentation:
S Centane and T Nyokong
Electrocatalytic behaviour of cobalt phthalocyanines in the presence of

graphene quantum dots.

70th Annual Meeting of the International Society of Electrochemistry
4-9 August, Durban International Convention Centre, Durban, South Africa
Oral Presentation
Sixolile Centane and Tebello Nyokong
The antibody assisted detection of human epidermal growth factor receptor on a cobalt porphyrin organic framework and gold functionalized graphene quantum dots modified electrode

South African Chemical Institute (SACI), Eastern Cape Postgraduate Seminars
Nelson Mandela University, Port Elizabeth, South Africa - 25th October 2019
Oral Presentation:
Sixolile Centane and Tebello Nyokong
The electrochemical detection of a cancer biomarker on a cobalt porphyrin binuclear framework and graphene quantum dot modified electrode (Awarded 1st Prize for Senior Section Presentations)

11th International Conference on Porphyrins & Phthalocyanines (ICPP-11)
28th June to 3rd July 2021 (Virtual Meeting)
Oral Presentation:
The Antibody Assisted Detection of Human Epidermal Growth Factor Receptor on a Cobalt Porphyrin Organic Framework and Gold - Graphene Quantum Dots Modified Electrode

AWARDS:

Awarded 1st Prize for Senior Section Presentations at the South African Chemical Institute (SACI), Eastern Cape Postgraduate Seminars held at Nelson Mandela University, Port Elizabeth 25th Oct 2019

OVERSEAS TRAVEL:

Ecole Nationale Supérieure de Chimie de Paris
Paris, France
Date: 1 Sept to 13 Oct 2016
Reason for visit: Research Collaboration (SA/France): MSc Exchange Student