



RHODES UNIVERSITY, MAKHANDA, SOUTH AFRICA



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EDUCATION DETAILS:

PhD (Chemistry) 2024 - Rhodes University, Makhanda, South Africa
MSc – with distinction (Chemistry) 2018 - Rhodes University
BScH (Chemistry) 2015 - Rhodes University
BSc (Chemistry and Biochemistry) 2014 - Rhodes University

RESEARCH TITLE/PROJECT:

Advanced Nanomaterials for Photocatalytic Microbial Inactivation and Wastewater Treatment:
Synthesis, Detection, and Optimization

PUBLICATIONS:

1. Sindelo, Azole; Osifeko, Olawale L.; Nyokong, Tebello
Synthesis, photophysicochemical and photodynamic antimicrobial chemotherapy studies of indium pyridyl phthalocyanines: Charge versus bridging atom
Inorganica Chimica Acta (2018), 476, 68-76
<https://doi.org/10.1016/j.ica.2018.02.020>
2. 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
<https://doi.org/10.1016/j.synthmet.2018.10.021>
3. Sindelo, A., Kobayashi, N., Kimura, M. and Nyokong, T.
Physicochemical and photodynamic antimicrobial chemotherapy activity of morpholine-substituted phthalocyanines: Effect of point of substitution and central metal
Journal of Photochemistry and Photobiology, A: Chemistry (2019), 374, 58-67
<https://doi.org/10.1016/j.jphotochem.2019.01.025>
4. Nene, L.C., Managa, M.E., Oluwole, D.O., Mafukidze, D.M., Sindelo, A. and Nyokong, T.
The photo-physicochemical properties and in vitro photodynamic therapy activity of differently substituted- zinc (II)-phthalocyanines and graphene quantum dots conjugates on MCF7 breast cancer cell line
Inorganica Chimica Acta (2019), 488, 304-311
<https://doi.org/10.1016/j.ica.2019.01.012>
5. Mafukidze, Donovan M.; Sindelo, Azole; Nyokong, Tebello
Spectroscopic characterization and photodynamic antimicrobial chemotherapy of phthalocyanine-silver triangular nanoprism conjugates when supported on asymmetric polymer membranes
Spectrochimica Acta, Part A: Molecular and Biomolecular Spectroscopy (2019), 219, 333-345
<https://doi.org/10.1016/j.saa.2019.04.054>
6. Sindelo Azole; Nyokong Tebello
Magnetic nanoparticle - indium phthalocyanine conjugate embedded in electrospun fiber for photodynamic antimicrobial chemotherapy and photodegradation of methyl red
Heliyon (2019), 5(8), 1-8, Article Number e02352
<https://doi.org/10.1016/j.heliyon.2019.e02352>
7. Pinar Sen, Azole Sindelo, Donovan M. Mafukidze, Tebello Nyokong
Synthesis and photophysicochemical properties of novel axially disubstituted silicon (IV) phthalocyanines and their photodynamic antimicrobial chemotherapy (PACT) activity against Staphylococcus aureus
Synthetic Metals 258 (2019) 116203 1-9
<https://doi.org/10.1016/j.synthmet.2019.116203>
8. Balaji Babu, Azole Sindelo, John Mack, Tebello Nyokong

Thien-2-yl substituted chlorins as photosensitizers for photodynamic therapy and photodynamic antimicrobial chemotherapy

Dyes and Pigments, 185 (2021) 10886 (1-8)

<https://doi.org/10.1016/j.dyepig.2020.108886>

9. Lindokuhle Cindy Nene, Azole Sindelo, Jonathan Britton and Tebello Nyokong

Effect of ultrasonic frequency and power on the sonodynamic therapy activity of cationic Zn(II) phthalocyanines

Journal of Inorganic Biochemistry 217 (2021) 111397 (1-12)

<https://doi.org/10.1016/j.jinorgbio.2021.111397>

10. Azole Sindelo, Donovan M Mafukidze and Tebello Nyokong

Fabrication of asymmetrical morpholine phthalocyanines conjugated chitosan-polyacrylonitrile nanofibers for improved photodynamic antimicrobial chemotherapy activity

Photodiagnosis and Photodynamic Therapy 38 (2022) 102760 (1-14)

<https://doi.org/10.1016/j.pdpdt.2022.102760>

11. Azole Sindelo, Jonathan Britton, Anabel E. Lanterna, Juan C. Scaiano and Tebello Nyokong

Decoration of glass wool with zinc (II) phthalocyanine for the photocatalytic transformation of methyl orange

Journal of Photochemistry and Photobiology A: Chemistry 432 (2022) 114127 (1-12)

<https://doi.org/10.1016/j.jphotochem.2022.114127>

12. Azole Sindelo, Lindokuhle Nene, Tebello Nyokong

Photodynamic antimicrobial chemotherapy with asymmetrical cationic or neutral metallophthalocyanines conjugated to amino-functionalized zinc oxide nanoparticles (spherical or pyramidal) against planktonic and biofilm microbial cultures

Photodiagnosis and Photodynamic Therapy 40 (2022) 103160 (1-13)

<https://doi.org/10.1016/j.pdpdt.2022.103160>

13. Azole Sindelo , Pinar Sen , Tebello Nyokong

Photodynamic inactivation of methicillin-resistant *Staphylococcus aureus* using pyrrolidinium containing Schiff base phthalocyanines

Journal of Photochemistry & Photobiology, A: Chemistry 438 (2023) 114535 (1-9)

<https://doi.org/10.1016/j.jphotochem.2022.114535>

14. Azole Sindelo, Pinar Sen, Tebello Nyokong

Photoantimicrobial activity of Schiff-base morpholino phthalocyanines against drug resistant micro-organisms in their planktonic and biofilm forms

Photodiagnosis and Photodynamic Therapy 42 (2023) 103519 (1-10)

DOI: 10.1016/j.pdpdt.2023.103519

<https://doi.org/10.1016/j.pdpdt.2023.103519>

15. Pinar Sen, Azole Sindelo, Nnaemeka Nnaji, John Mack and Tebello Nyokong

Diiodinated Mono- and Dipyridylvinyl BODIPY Dyes: Photophysicochemical Properties, *in vitro* Antibacterial Studies, Molecular

Photochemistry and Photobiology, 2023, 99: 947–956

<https://doi.org/10.1111/php.13698>

16. Azole Sindelo, Tebello Nyokong

Photoinactivation of microorganisms and photodegradation of pollutants using phthalocyanines supported on nanofibers and glass wool

Journal of Photochemistry & Photobiology, A: Chemistry 447 (2024) 115236 (1-12)

<https://doi.org/10.1016/j.jphotochem.2023.115236>

17. Azole Sindelo, Tebello Nyokong

Photoinactivation of microorganisms and photodegradation of pollutants using phthalocyanines supported on nanofibers and glass wool

Journal of Photochemistry & Photobiology, A: Chemistry 447 (2024) 115236 (1-12)

<https://doi.org/10.1016/j.jphotochem.2023.115236>

18. Akwesi Ndundu, Nthabeleng R. Molupe, Azole Sindelo, Lohohola Osomba,

Malongwe K'Ekuboni, Bokolombe P. Ngoy, John Mack and Tebello Nyokong

Antimicrobial Photodynamic Therapy Activity Properties of 2,6-Brominated and -Iodinated BODIPY Core Dyes and their π -Extended 3,5-Distyryl Analogues

Macroheterocycles 17(4) (2024) 306-314

<https://doi.org/10.6060/mhc245998n>

19. Vuyokazi Nobatana, James Oyim, Nnamdi Nwahara, Azole Sindelo, Tebello Nyokong

The photodynamic anti-cancer and anti-bacterial behaviour of meso-substituted trans-A2B2 porphyrin conjugated silica-gold nanoparticles

Inorganica Chimica Acta 579 (2025) 122584 (1-13)

<https://doi.org/10.1016/j.ica.2025.122584>

WORKSHOPS/CONFERENCES:

7th Annual DST/Mintek Nanotechnology Innovation Centre (NIC) Workshop - 25-26 Jan 2017

Medical Research Council of South Africa (MRC), Cape Town, South Africa

Oral Presentation:

Azole Sindelo and Tebello Nyokong

Development of magnetic nanoparticles-phthalocyanines conjugates for inactivation of bacteria

Oral Presentation

Symposium on Chemico- and Biomedical Research

Zoology Major Lecture Theatre, Rhodes University - 23 June 2017

Oral Presentation:

Azole Sindelo, Olawale Osifeko and Tebello Nyokong

Photo inactivation of bacteria and fungus using indium phthalocyanines conjugate to magnetic nanoparticles

International Conference on Surfaces, Coatings and Nanostructured Materials (NANOSMAT-Africa Conference), Cape Town, 19-23 November 2018

Oral Presentation:

Azole Sindelo and Tebello Nyokong

Development of Magnetic Nanoparticles-Phthalocyanine Conjugates for Inactivation of Bacteria

11th International Conference on Porphyrins & Phthalocyanines (ICPP-11)

28th June to 3rd July 2021 (Virtual Meeting)

Oral Presentation:

Azole Sindelo and Tebello Nyokong

Development of Magnetic Nanoparticles-Phthalocyanine Conjugates for Photoinactivation of Bacteria

OVERSEAS TRAVEL:

Shinshu University, Ueda, Japan

1 Sept to 31 Oct 2017

Research Collaboration (NRF SA/Japan) – Exchange student

Ms Azole Sindelo

8 May – 6 August 2019

University of Ottawa, Ottawa, Canada

Reason: Exchange Student – NRF South Africa/Canada Research Collaboration

AWARDS:

Best ORAL presentation at the NANOSMAT International Conference held in Cape Town (Nov 2018)