RHODES UNIVERSITY, GRAHAMSTOWN, SOUTH AFRICA

STAFF INFORMATION

PROF PHILANI MASHAZI
DEPUTY DIRECTOR

CONTACT DETAILS:

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EDUCATION DETAILS:

Phd (Chemistry) 2012 - Rhodes University, Grahamstown, South Africa
MSc (Chemistry with distinction) 2007 - Rhodes University, Grahamstown, South Africa
BScH 2004 - Rhodes University, Grahamstown, South Africa
BSc 2003 - Rhodes University, Grahamstown, South Africa

EMPLOYMENT HISTORY:

CURRENT:

Deputy Director
Rhodes/DST Institute for Nanotechnology Innovation, Rhodes University, Grahamstown

Associate Professor & Lecturer (Analytical and Inorganic Chemistry)
Chemistry Department, Rhodes University, Grahamstown

Dr Mashazi, spent 7 years at the Council for Minerals Technology (Mintek) as a research scientist from February 2007 to September 2013. During his tenure at Mintek, Dr Mashazi studied his doctoral degree part-time and graduated with the Doctor of Philosophy (PhD) degree at Rhodes University in April 2012. He joined Rhodes University Chemistry Department as a Senior Lecturer of Inorganic Chemistry since October 2013. He is currently involved in many departmental activities whilst pursuing his research interests. He further provides support to the National Facility funded by the Department of Science and Technology, the Institute for Nanotechnology Innovation. He manages two state-of-the-art equipments, that is the X-ray photoelectron spectroscopy (XPS) and the TOF-SIMS (Time-of-flight Secondary Ion Mass Spectrometry). Both these techniques are a very sensitive surface analytical techniques well established for many industrial and research applications.

TEACHING 2013 - Present

- 1st Year – Kinetics and Electrochemistry
- 2nd Year – Kinetics and Electroanalytical Techniques
- 3rd Year – Crystallography (2013 – 2018)
- Honours - Intelligent Nanomaterials and Their Applications, Design and Development of Biosensors

RESEARCH INTEREST:

- Design of nanomaterials with intrinsic peroxidase- or catalase-like properties for biosensor applications.
- Surface chemical characterization of immobilized electrocatalytic N4-macrocycle metal complexes for electrochemical sensing.
- Nanofabrication of electrode surfaces for enhanced electrocatalytic applications and detection of biomedical molecules.
- Design of methods for disease biomarker detection using electrochemical and optical biosensors: biomarkers for communicable and non-communicable diseases.
- Investigation of methods of integrating biological molecules with nanostructured materials for the design of highly sensitive and selective novel sensors and/or biosensors.
- Design of immunochromatographic lateral-flow systems integrating electrochemical signal generation for diagnostic applications.
- Investigating N4-macrocycle metal complexes and their nanomaterials conjugates as potential dyes for the fabrication dye-sensitized solar cells.

PUBLICATIONS:

2025 Publications:

1. 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

2. Lunathi Ncwane, Philani Mashazi, Tebello Nyokong
Phthalocyanine based metal organic frameworks for electrochemical detection of human epidermal growth factor receptor 2
Bioelectrochemistry 265 (2025), 108966 (1-9)
DOI: 10.1016/j.bioelechem.2025.108966
https://doi.org/10.1016/j.bioelechem.2025.108966

2024 Publications:

3. Luhana, Charles; Mashazi, Philani
Conducting Nickel Hydroxide Thin Film on Molybdenum Disulfide - Reduced Graphene Oxide Composite Electrode for Simultaneous Detection of Uric Acid, Dopamine and Ascorbic Acid
ChemElectroChem 11 (2024) e202400149 (1 of 9)
DOI: 10.1002/celc.202400149
http://doi.org/10.1002/celc.202400149

2023 Publications:

4. Moyo, I., Mwanza, D., Mashazi P.
pH sensitive thin films of iron phthalocyanines as electrocatalysts for the detection of neurotransmitters
Journal of Organometallic Chemistry, 990, 122662
DOI: 10.1016/j.jorganchem.2023.122662

5. Moyo, I., Mwanza, D., Mashazi P.
pH sensitive thin films of iron phthalocyanines as electrocatalysts for the detection of neurotransmitters
Journal of Organometallic Chemistry, 990, 122662
DOI: 10.1016/j.jorganchem.2023.122662

6. Luhana, C., Mashazi, P.
Simultaneous Detection of Dopamine and Paracetamol on Electroreduced Graphene Oxide–Cobalt Phthalocyanine Polymer Nanocomposite Electrode
Electrocatalysis, 14 (3), (2023) pp. 406-417
DOI: 10.1007/s12678-022-00806-7

7. Adesina, A., Adeniyi, O., Mashazi, P.
Online regeneration of a piezoelectric and impedimetric immunosensor for the detection of C-reactive protein on the oriented antibody gold surface
Analytical Methods, 15 (9), (2023) 1157-1167
DOI: 10.1039/d2ay01245f

8. Chavalala, R., Mashazi, P.
Au/Pd Nanocatalysts on Silica Nanoparticle-Coated Indium Tin Oxide for Colorimetric Sensing of Ascorbic Acid
ACS Applied Nano Materials, 6 (1), (2023) pp. 190-199
DOI: 10.1021/acsanm.2c04234

9. Adesina, A., Adeniyi, O., Mashazi, P.
Nanomagnet Bioconjugates with anti-CRP Polyclonal Antibodies as Nanobioprobes for Enhanced Impedimetric Detection of CRP
Electroanalysis, 35 (1), (2023) e202200059
DOI: 10.1002/elan.202200059

7. Sendibitiyosi Gandidzanwa, Natasha Beukes, Sinelizwi V Joseph, Arno Janse Van Vuuren, Philani Mashazi, Jonathan Britton, Gareth Kilian, Saartjie Roux , Tebello Nyokong, Michael E Lee, Carminita L Frost and Zenixole R Tshentu
The development of folate-functionalised palladium nanoparticles for folate receptor targeting in breast cancer cells
Nanotechnology 34 (2023) 465705 (1-15)
DOI: 10.1088/1361-6528/acec52
https://doi.org/10.1088/1361-6528/acec52

2022 Publications:

8. Daniel Mwanza, Omotayo Adeniyi, Solomon Tesfalidet, Tebello Nyokong, Philani Mashazi
Capacitive label-free ultrasensitive detection of PSA on a covalently attached monoclonal *anti*-PSA antibody gold surface
Journal of Electroanalytical Chemistry 927 (2022) 116983 (1-9)
DOI: 10.1016/j.jelechem.2022.116983
https://doi.org/10.1016/j.jelechem.2022.116983

9. N.C. Gatsi, G.H. Mhlongo, N. Moloto, R.M. Erasmus, **P. Mashazi**, T. Nyokong, O.M. Ntwaeaborwa
Hierarchically-ordered nanorods of Ga_2O_3 derived from microwave-assisted hydrothermal approach: Investigation of calcination-induced structural evolution and optical behavior
Materials Today Communications 33 (2022) 104808 (1-8)
DOI: 10.1016/j.mtcomm.2022.104808
https://doi.org/10.1016/j.mtcomm.2022.104808

10. Adeniyi, Omotayo; **Mashazi, Philani**
Kirigami paper-based colorimetric immunosensor integrating smartphone readout for determination of humoral autoantibody immune response
Microchemical Journal (2022), 178, 107427

DOI: 10.1016/j.microc.2022.107427
https://doi.org/10.1016/j.microc.2022.107427

11. Daniel Mwanza, N Mfamela, O Adeniyi, Tebello Nyokong, **Philani Mashazi**
Ultrasensitive detection of prostate-specific antigen using glucose-encapsulated nanoliposomes anti-PSA polyclonal antibody as detection nanobioprobes
Talanta, 245 (2022) 123483 (1-9)
DOI: 10.1016/j.talanta.2022.123483
https://doi.org/10.1016/j.talanta.2022.123483

12. Ené Storm, Emile D Maggott, **Philani Mashazi**, Tebello Nyokong, Rehana Malgas-Enus and Selwyn F Mapolie
Application of gold and palladium nanoparticles supported on polymelamine microspheres in the oxidation of 1-phenylethanol and some other phenyl substituted alcohols
Molecular Catalysis 528 (2022) 112456 (1-11)
DOI: 10.1016/j.mcat.2022.112456
https://doi.org/10.1016/j.mcat.2022.112456

13. Songeziwe Ntsimango, Sendibitiyosi Gandidzanwa, Sinelizwi V. Joseph, Eric C. Hosten, Marvin Randall, Adrienne L. Edkins, Samson M. Khene, **Philani Mashazi**, Tebello Nyokong, Abubak'r Abrahams, and Zenixole R. Tshentu
Reaction of Perrhenate with Phthalocyanine Derivatives in the Presence of Reducing Agents and Rhenium Oxide Nanoparticles in Biomedical Applications
ChemistryOpen 2022, 11, e202200037 (1-13)
DOI: 10.1002/open.202200037
https://doi.org/10.1002/open.202200037

14. Adesina Abiola, Omotayo Adeniyi, **Philani Mashazi**
Nanomagnetic bioconjugates with *anti*-CRP polyclonal antibodies as nanobioprobes or enhanced impedimetric detection of CRP.
Electroanalysis 2022 (34) 1–12
https://doi.org/10.1002/elan.202200059

15. Charles Luhana, Iphithuli Moyo, Keamogeste Tshenkeng, **Philani Mashazi*** In-sera selectivity detection of catecholamine neurotransmitters using covalent composite of cobalt phthalocyanine and aminated graphene quantum dots**.**
Microchem. J. 2022 (180) 107605
https://doi.org/10.1016/j.microc.2022.107605

16. Iphithuli Moyo, Daniel Mwanza, **Philani Mashazi***, Novel covalent immobilization of cobalt (II) octa acyl chloride phthalocyanines onto phenylethylamine pre-grafted gold via spontaneous amidation**.**
Electrochimica Acta 2022 (422) 140550
https://doi.org/10.1016/j.electacta.2022.140550

17. Nwahara, M. Motaung, G. Abrahams, **P. Mashazi**, J. Mack, E. Prinsloo, T. Nyokong
Dual singlet oxygen and nitric oxide-releasing silicon phthalocyanine for augmented photodynamic therapy
Materials Today Chemistry 26 (2022) 101201 (1-14)
DOI: 10.1016/j.mtchem.2022.101201
https://doi.org/10.1016/j.mtchem.2022.101201

2021 Publications:

18. Adeniyi, Omotayo; Sicwetsha, Simbongile; Adesina, Abiola; **Mashazi, Philani**
Immunoassay detection of tumor-associated autoantibodies using protein G bioconjugated to nanomagnet-silica decorated with Au@Pd nanoparticles
Talanta 226 (2021) 122127
DOI: 10.1016/j.talanta.2021.122127
https://doi.org/10.1016/j.talanta.2021.122127

9. Nwahara, Nnamdi; Adeniyi, Omotayo; **Mashazi, Philani**; Nyokong, Tebello
Visible light responsive TiO_2 - graphene oxide nanosheets - Zn phthalocyanine ternary heterojunction assisted photoelectrocatalytic degradation of Orange G
Journal of Photochemistry and Photobiology, A: Chemistry (2021), 414, 113291
DOI:10.1016/j.jphotochem.2021.113291
https://doi.org/10.1016/j.jphotochem.2021.113291

10. Omotayo Adeniyi; Nnamdi Nwahara; Daniel Mwanza; Tebello Nyokong, **Philani Mashazi**
Nanohybrid electrocatalyst based on cobalt phthalocyanine-carbon nanotube-reduced graphene oxide for ultrasensitive detection of glucose in human saliva
Sensors and Actuators B: Chemical (2021) 348, 130723 (1-13)
DOI: 10.1016/j.snb.2021.130723
https://doi.org/10.1016/j.snb.2021.130723

11. Nyemaga Masanje Malima, Malik Dilshad Khan, Jonghyun Choi, Ram K. Gupta**, Philani Mashazi**, Tebello Nyokong and Neerish Revaprasadu
Solventless synthesis of nanospinel $Ni_{1-x}Co_xFe_2O_4$ ($0 \leq x \leq 1$) solid solutions for efficient electrochemical water splitting and supercapacitance
RSC Advances (2021), 11, 31002-31014
DOI: 10.1039/D1RA04833C
https://doi.org/10.1039/D1RA04833C

12. Ginena Bildard Shombe, Shumaila Razzaque, Malik Dilshad Khan, Tebello Nyokong, Philani Mashazi, Jonghyun Choi, Sanket Bhoyate, Ram K. Gupta and Neerish Revaprasadu
Low temperature scalable synthetic approach enabling high bifunctional electrocatalytic performance of $NiCo_2S_4$ and $CuCo_2S_4$ thiospinels
RSC Advances, 11 (2021) 31533-31546
DOI: 10.1039/d1ra02309h
https://doi.org/10.1039/D1RA02309H

13. Daniel Mwanza, Sereilakhena Phal, Tebello Nyokong, Solomon Tesfalidet, Philani Mashazi

Electrografting of isophthalic acid monolayer and covalent attachment of antibody onto carbon surfaces: Construction of capacitive biosensor for methotrexate detection.
Electrochimica Acta 398 (2021) 139360 (1-9)
DOI: 10.1016/j.electacta.2021.139360
https://doi.org/10.1016/j.electacta.2021.139360

14. Abiola Adesina and Philani Mashazi
Oriented Antibody Covalent Immobilization for Label-Free Impedimetric Detection of C-Reactive Protein via Direct and Sandwich Immunoassays
Frontiers in Chemistry, 9 (2021) 587142 (1-12)
DOI: 10.3389/fchem.2021.587142
https://doi.org/10.3389/fchem.2021.587142

15. Simbongile Sicwetsha, Sindisiwe Mvango, Tebello Nyokong & Philani Mashazi
Effective ROS generation and morphological effect of copper oxide nanoparticles as catalysts
Journal of Nanoparticle Research (2021) 23: 227 (1-18)
DOI: 10.1007/s11051-021-05334-x
https://doi.org/10.1007/s11051-021-05334-x

16. Simbongile Sicwetsha, Omotayo Adeniyi and Philani Mashazi
Bimetallic gold and palladium nanoparticles supported on copper oxide nanorods for enhanced
H_2O_2 catalytic reduction and sensing
RSC Advances, 11 (2021) 28818–28828
DOI: 10.1039/d1ra05247k
https://doi.org/10.1039/D1RA05247K

2020 Publications:

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

18. Nqobile Njoko, Marcel Louzada, Jonathan Britton, Samson Khene, Tebello Nyokong, **Philani Mashazi***, **Bioelectrocatalysis and surface analysis of gold coated with nickel oxide/hydroxide and glucose oxidase towards detection of glucose**. Colloids and Surfaces B: Biointerfaces, 2020 (190) 110981.
https://doi.org/10.1016/j.colsurfb.2020.110981

19. Omotayo Adeniyi, Simbogile Sicwetsha, **Philani Mashazi**, **Nanomagnet-silica nanoparticles decorated with Au@Pd for enhanced peroxidase-like activity and colorimetric glucose sensing.** ACS Applied Materials & Interfaces, 2020 (12) 1973 - 1987. http://pubs.acs.org/doi/abs/10.1021/acsami.9b15123

20. Omotayo Adeniyi, **Philani Mashazi**, **Stable thin films of human P53 antigen on gold**

surface for the detection of tumour associated anti-P53 autoantibodies, Electrochimica Acta, 2020 (331) 135272 https://doi.org/10.1016/j.electacta.2019.135272

21. Keamogetse Tshenkeng, **Philani Mashazi** **Covalent attachment of cobalt (II) tetra-(3-carboxyphenoxy) phthalocyanine onto pre-grafted gold electrode for the determination of catecholamine neurotransmitters** Electrochimica Acta 360 (2020) 137015 https://doi.org/10.1016/j.electacta.2020.137015

22. Phal, Sereilakhena; Shimizu, Kenichi; Mwanza, Daniel; **Mashazi, Philani**; Shchukarev, Andrey; Tesfalidet, Solomon **Electrografting of 4-carboxybenzenediazonium on glassy carbon electrode: the effect of concentration on theformation of mono and multilayers** Molecules (2020), 25(19), 4575 DOI: 10.3390/molecules25194575

23. Adeniyi, Omotayo K.; Ngqinambi, Akhona; **Mashazi, Philani N** **Ultrasensitive detection of anti-p53 autoantibodies based on nanomagnetic capture and separation withfluorescent sensing nanobioprobe for signal amplification** Biosensors & Bioelectronics (2020), 170, 112640 DOI:10.1016/j.bios.2020.112640

24. Phal Sereilakhena; Shimizu Kenichi; Shchukarev Andrey; Tesfalidet Solomon; Mwanza Daniel; Mashazi Philani **Electrografting of 4-Carboxybenzenediazonium on Glassy Carbon Electrode: The Effect of Concentration onthe Formation of Mono and Multilayers** Molecules (Basel, Switzerland) (2020), 25(19)

Older:

25. Sixberth Mlowe, Ginena B. Shombe, Matthew P. Akerman, Egid B. Mubofu, Paul O'Brien, **Philani Mashazi**, Tebello Nyokong, Neerish Revaprasadu, **Mophorlogical influence of deposition routes on lead sulphide thin films**, Inorganica Chimica Acta, 2019 (498) 119116. https://doi.org/10.1016/j.ica.2019.119116

26. Charles Gervas, Malik Dilshan Khan, Sixberth Mlowe, Chunyang Zhang, Chen Zhao, Ram K. Gupta, Matthew P. Akerman, **Philani Mashazi**, Tebello Nyokong, **Philani Mashazi**, Neerish Revaprasadu, **Synthesis of off-stoichiometry CoS nanoplates from molecular precursor for efficient H2/O2 evolution and super-capacitance**, ChemElectroChem, 2019 (6) 2560 - 2569. https://doi.org/10.1002/celc.201900413

27. Zainab O Makinde, **Philani Mashazi**, Samson Khene, **Electrocatalytic behavior of single- walled carbon nanotubes with alkythio-substituted cobalt binuclear phthalocyanines towards oxidation of 4-chlorophenols,** Journal of Porphyrins and Phthalocyanines, 2019 (23) 142 - 153. https://doi.org/10.1142/S1088424619500172

28. Sindisiwe Mvango, **Philani Mashazi**, **Synthesis, characterization of copper oxide-gold**

nanoalloys and their peroxidase-like activity towards colorimetric detection of glucose, Materials Science and Engineering C, 2019 (96) 814 - 823. https://doi.org/10.1016/j.msec.2018.12.010

29. 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 2018 (246) 236 - 245. https://doi.org/10.1016/j.synthmet.2018.10.021.

30. Daniel Mwanza, Marcel Louzada, Jonathan Britton, Tebello Nyokong, Samson Khene, **Philani Mashazi, The effect of the cobalt and manganese central metal ions on the non-linear optical properties of tetra(4-propargyloxyphenoxy) phthalocyanines**, New Journal of Chemistry, 2018 (42) 9857 - 9864. https:// 10.1039/c8nj00748a.

31. Daniel Mwanza, Sindisiwe Mvango, Samson Khene, Tebello Nyokong, **Philani Mashazi**, **Exploiting click chemistry for the covalent immobilization of tetra (4-propargyloxyphenoxy) metallophthalocyanines onto prehylazide grafted gold surfaces**, Electrochimica Acta, 254 (2017) 89 – 100. https://doi.org/10.1016/j.electacta.2017.09.115.

32. Zainab O. Makinde, Marcel Louzada, **Philani Mashazi**, Tebello Nyokong, Samson Khene, **Electrocatalytic behaviour surface of confined pentanethio cobalt (II) binuclear phthalocyanines towards the oxidation of 4-chlorophenol,** Applied Surface Science, 425 (2017) 702–712. http://dx.doi.org/doi:10.1016/j.apsusc.2017.06.271.
33. Daniel Mwanza, Samson Khene, **Philani Mashazi**, **Tetra (4-propargyloxyphenoxy) phthalocyanines: facile synthesis, fluorescence and thermal properties**, Polyhedron, 134 (2017) 263–274, http://dx.doi.org/10.1016/j.poly.2017.06.029.
34. Sandile S. Gwebu, Philiswa N. Nomngongo, **Philani N Mashazi**, Tebello Nyokong, Nobanathi Maxakato, **Platinum Nanoparticles Supported on Carbon Nanodots as Anode Catalysts for Direct Alcohol Fuel Cells**, *Int. J. Electrochem. Sci.,* 12 **(2017)** 6365 – 6378, http://dx.doi.org/10.20964/2017.07.09.
35. Siphesihle Robin Nxele, **Philani Mashazi**, Tebello Nyokong, **Surface functionalization of glassy carbon electrodes via adsorption, electrografting and click chemistry using quantum dots and alkynyl substituted phthalocyanines: a brief review**, *Proceedings SPIE, V*10036 (2017) 100360D, Fourth Conference on Sensors, MEMS, and Electro-Optic Systems. http://dx.doi.org/10.1117/12.2245687.
36. Mbuso Mlambo, Richard A. Harris, **Philani Mashazi**, Myalowenkosi Sabela, Suvardhan Kanchi, Lawrence M. Madikizela, Prince N. Shumbula, Nosipho Moloto, Thulani T. Hlatshwayo, Phumlani S. Mdluli, **Computational and experimental evaluation of selective substitution of thiolated coumarin derivatives on gold nanoparticles: surface enhancing Raman scattering and electrochemical studies**, Applied Surface Science 396 (2017) 695 - 704. http://dx.doi.org/10.1016/j.apsusc.2016.11.011.

37. Donovan M. Mafukidze, **Philani Mashazi**, Tebello Nyokong, **Synthesis and singlet oxygen production by a phthalocyanine when embedded in asymmetric polymer membranes**, Polymer 105 (2016) 203 - 213. http://dx.doi.org/10.1016/j.polymer.2016.10.032.

38. Olawale L. Osifeko, Imran Uddin, **Philani N. Mashazi**, Tebello Nyokong, **Physicochemical and antimicrobial photodynamic chemotherapy of unsymmetrical indium phthalocyanines**

alone on in the presence of magnetic nanoparticles, New Journal of Chemistry, 2016 (40) 2710 - 2721. http://dx.doi.org/10.1039/c5nj01922b.

39. Stephen Nyoni, **Philani Mashazi**, Tebello Nyokong, **Electrode modification using nanocomposites of electropolymerised cobalt phthalocyanines supported on multi-walled carbon nanotubes,** Journal of Solid State Electrochemical, 2016 (20) 1075 – 1086. http://dx.doi.org/10.1007/s10008-015-2985-6.

40. Oluwasesan Adegoke, **Philani Mashazi**, Tebello Nyokong, Patricia B.C. Forbes**, Fluorescence properties of alloyed ZnSeS quantum dots overcoated with ZnTe and ZnTe/ZnS shells**, Optical Materials , 2016 (54) 104 - 110. http://dx.doi.org/10.1016/j.optmat.2016.02.024.

41. Munyaradzi Shumba, **Philani Mashazi,** Tebello Nyokong "**Turn on" fluorescence enhancement of Zn octacarboxy phthaloyanine-Graphene Oxide Conjugates by hydrogen peroxide**. Journal of Luminescence, 2016 (170) 317-324. http://dx.doi.org/10.1016/j.jlumin.2015.11.001.

42. Sihle Nxele, **Philani Mashazi**, Tebello Nyokong, **Construction of a Hydrazine Sensor using an Alkynyl Tetra-Substituted Fe(II) Phthalocyanine via Electrografting and Click Chemistry**, Electroanalysis, 2015 (27) 2468-2478. http://dx.doi.org/10.1002/elan.201500212.

43. Sarah D'Souza, **Philani Mashazi**, Jonathan Britton, Tebello Nyokong, **Effects of differently shaped silver nanoparticles on the photophysics of mercaptopyridine-substituted phthalocyanines**, Polyhedron, 2015 (99) 112–121. http://dx.doi.org/10.1016/j.poly.2015.06.038.

44. David Oluwole, Jonathan Britton, **Philani Mashazi,** Tebello Nyokong, **'Synthesis and photophysical properties of nanocomposites of aluminum tetrasulfonated phthalocyanine covalently linked to glutathione capped CdTe/CdS/ZnS quantum dots***, Synthetic Metals*, 2015 (**205**) 212-221. http://dx.doi.org/10.1016/j.synthmet.2015.04.015.

45. Racheal Ogbodu, Edith Amuhaya, **Philani Mashazi**, Tebello Nyokong, **Photophysical Properties of Zinc Phthalocyanine-Uridine Single Walled Carbon Nanotube – conjugates**, *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*, 2015(149) 231-239. http://dx.doi.org/10.1016/j.saa.2015.04.040.

46. Stephen Nyoni, **Philani Mashazi**, Tebello Nyokong**, Iodine-Doped Cobalt Phthalocyanine Supported on Multiwalled Carbon Nanotubes for Electrocatalysis of Oxygen Reduction Reaction**, *Electroanalysis,* 2015 (27) 1176-1187. http://dx.doi.org/10.1002/elan.201400499.

47. Audacity Maringa, **Philani Mashazi**, Tebello Nyokong, **Electrocatalytic activity of bimetallic Au-Pd nanoparticles in the presence of cobalt tetra-amino phthalocyanine**, *Journal of Colloidal and Interface Science* 2015 (**440**) 151–161. http://dx.doi.org/10.1016/j.jcis.2014.10.056.

48. Audacity Maringa, **Philani Mashazi**, Tebello Nyokong, **Characterization of electrodes modified by one-pot or step-by-step electro-click reaction and axial ligation of iron tetra-**

carboxy phthalocyanine, *Electrochimica Acta*, 2014 (**145**) 237 - 244. http://dx.doi.org/10.1016/j.electacta.2014.09.011.

49. **Philani Mashazi****, Sibulelo Vilakazi, Tebello Nyokong, **Design and evaluation of an electrochemical immunosensor for measles serodiagnosis using measles-specific Immunoglobulin G antibodies**, *Talanta*, 2013 (**115**) 694 – 701. http://dx.doi.org/10.1016/j.talanta.2013.06.036.

50. Mbuso Mlambo, Siyasanga Mpelane, Phumlane Mdluli, **Philani Mashazi**, Lucky Sikhwivhilu, Nosipho Moloto and Makwena Moloto, **Unique flexible silver dendrites thin films fabricated on cellulose dialysis cassettes***, Journal of Material Science*, 2013 (**48**) 6418 - 6425. http://dx.doi.org/10.1007/s10853-013-7442-2.

51. **Philani Mashazi****, Phumlani Tetyana, Sibulelo Vilakazi and Tebello Nyokong, **Electrochemical impedimetric immunosensor for the detection of measles-specific IgG antibodies after measles infections,** *Biosensors and Bioelectronics*, 2013 (**49**) 32 - 38. http://dx.doi.org/10.1016/j.bios.2013.04.028.

52. **Philani N. Mashazi****, Nolwazi Nombona, Munkombwe Muchindu and Sibulelo Vilakazi**, metallophthalocyanines and metalloporphyrins as electrocatalysts: a case of hydrogen peroxide and glucose detection,** *Journal of Porphyrins and Phthalocyanines*, 2012 (**16**) 741 - 753. http://dx.doi.org/10.1142/S1088424612300066.

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