

Curriculum Vitae

Contact Information

Name: Immaculate Linda Achieng' Ouma
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Professional Profile: A diligent individual with research and academic experience. Interested in the manipulation of materials at the nanoscale to improve livelihood and lower the burden on natural resources. Passionate about passing on acquired skills to young scientists particularly in the developing world.

Experience

- Chairperson, Faculty of Science Graduate Studies Committee. *February 2021 - Present:* Managing postgraduate students research in the Faculty and coordinating seminars and presentations of research proposals and findings. Representing the Faculty in the School of Graduate Studies Board and Examiners panels for oral examinations of Theses.
- Department of Science, Technology and Engineering Undergraduate Research Projects Coordinator. *February 2020 - Present:* Managing undergraduate students' projects from proposal writing and presentation to final report presentation and submission.
- Chemistry lecturer (Kibabii University, Kenya). *December 2019 – Present:* Teaching Undergraduate and Postgraduate chemistry courses. Supervising postgraduate students' research. Conducting research projects and developing proposals for funding.
- Postdoctoral fellow in the Nanotechnology and organometallics research laboratory (University of the Western Cape, South Africa). *January 2020- Present:* Designing and synthesizing magnetic nanoparticles for wastewater treatment.
- Postdoctoral fellow in the Biosorption and wastewater treatment research laboratory (Vaal University of Technology, South Africa) *August 2019- December 2019:* Developing novel nanomaterials for treatment of heavy metal polluted water, testing their applications and determining their pollutant uptake mechanisms.
- Researcher in adsorptive wastewater treatment at the Biosorption and catalysis laboratory and Centre for Renewable Energy and Water (Vaal University of Technology, South Africa) *April 2014- December 2018:* Presenting research ideas for the development of suitable materials for the treatment of heavy metal contaminated wastewater. Carrying out the preparation and characterization of adsorbent materials and wastewater treatment in laboratory scale and determines the pathways for the treatment process through analytical techniques.
- Co-supervising B-Tech students (Vaal University of Technology, South Africa) *April 2014-Dec 2018:* Conceptualizing research projects for BTech students and training them in the requisite research techniques and laboratory analysis to enable the successful completion of their BTech training.
- Chemistry tutor (Vaal University of Technology, South Africa), *April 2014-May 2019:* Mentoring undergraduate students in chemistry courses providing an interface between lectures and students. Mentoring honours and masters students in research projects and providing the requisite training to enable them carry out successful research careers in the field of chemistry.
- Researcher at the Organometallics laboratory (University of the Western Cape, South Africa), *July 2012- Dec 2013:* Developing nanomaterials scale for application in cancer research in collaboration with colleagues from the biotechnology department.

- Chemistry tutor (University of the Western Cape, South Africa), *July 2012-Dec 2013*: Mentoring undergraduate students in chemistry courses providing an interface between lectures and students. Mentoring honours students in research projects and provided the requisite training to enable them carry out successful research careers in the field of chemistry.
- Graduate Clerk at Co-operative Bank of Kenya, *May 2010 – June 2012*: Customer service including serving as a bulk teller, cash officer, accounts opening clerk, ATM custodian, customer service officer and sales officer.
- Research assistant (University of Nairobi, Kenya), *Sept 2009-April 2010*: Extracting and characterizing of active compounds from plants and testing the biological activity of extracted compounds.

Postgraduate student supervision

1. Otieno Lucas (MSc). A mathematical model of chlorine concentration in contact tanks using numerical solution of a 1-dimensional convection-diffusion equation (In progress).
2. Macheso Geoffrey (MSc) Assessment of natural radioactivity levels in brands of chemical fertilizers on kenyan market (In progress).
3. Adivhaho Sithari (BSc Hons) Citronellal Schiff base Ligand Derivatives as Potential Drugs for the Treatment of Multi Drug Resistant TB (In progress).

PhD Thesis: Preparation and Characterization of Manganese Doped Iron Oxide Magnetic Nanoparticles Coated Pine Cone Powder and its Application in Water Treatment.

MSc Thesis: Synthesis, optical and morphological characterization of PbSe quantum dots for diagnostic studies: A model study.

Skills: Design expert for reaction optimization, Avogadro molecule visualizer, Origin specialized graphing software, Chemdraw 2D and 3D molecule drawing software, CasaXPS processing software, PowDLL converter software. Analytical techniques including XPS, XRD, TEM, SEM, TGA, VSM, ICP, AAS and FTIR.

Professional affiliation: Royal Society of Chemistry (RSC), South African Chemical Institute (SACI), Water Institute of Southern Africa (WISA), Africa Materials Research Society (AMRS) and Golden Key International Honour Society.

Publications

1. **Linda Ouma**, Martin Onani. Investigating the influence of redox processes during the adsorption of hexavalent chromium on Fe₃O₄ nanoparticles. (*In progress*).
2. **Linda Ouma**, Augustine Ofomaja. Probing the interaction effects of metal ions in Mn_xFe_(3-x)O₄ on arsenite oxidation and adsorption. *RSC Advances* (2020) 10:2812
3. **Immaculate L. A. Ouma**, Eliazer B. Naidoo, Augustine E. Ofomaja. “An Insight into the Adsorption Mechanism of Hexavalent Chromium onto Magnetic Pine Cone Powder” in *Chemistry for a Clean and Healthy Planet* edited by Ramasami, P., Gupta Bhowon, M., Jhaumeer Laulloo, S., Li Kam Wah, H. Springer Nature, 2019.
4. **Immaculate L. A. Ouma**, Eliazer B. Naidoo, Augustine E. Ofomaja. Thermodynamic, Kinetic and Spectroscopic Investigation of Arsenite Adsorption Mechanism on Pine Cone-Magnetite Composite. *Journal of Environmental Chemical Engineering* (2018) 6:5409.

5. **Immaculate L. A. Ouma**, Augustine E. Ofomaja, Eliazer B. Naidoo. Magnetic nanoparticles stabilized by lignocellulosic waste as green adsorbent for Cr(VI) removal from wastewater. *European Physical Journal: Applied Physics* (2017) 79:30401.
6. **Immaculate L. A. Ouma**, Paul Mushonga, Martin Onani. Effects of reaction parameters on the growth of PbSe nanocrystals. *Journal of Nano Research* (2015) 34:79.
7. Paul Mushonga, **Immaculate L. A. Ouma**, Abram M. Madiehe, Mervin Meyer, Francis B. Dejene, Martin O. Onani. Synthesis, optical and morphological characterization of doped-InP/ZnSe NCs. *Physica B: Condensed matter* (2014) 439:189.
8. **Immaculate L. A. Ouma**, Paul Mushonga, Abram M. Madiehe, Mervin Meyer, Francis B. Dejene, Martin O. Onani. Synthesis, optical and morphological characterization of MPA-capped PbSe nanocrystals. *Physica B: Condensed matter* (2014) 439: 130.

Conference contributions

1. **Linda Ouma**, Martin Onani. Hexavalent Chromium Reduction and Adsorption on Magnetite Surfaces. *Virtual Conference on Chemistry and its Applications*, Mauritius. 09th - 13th August 2021.
2. **Linda Ouma**, Martin Onani. Influence of redox processes during the adsorption of multi-valent pollutants on Fe₃O₄ nanoparticles. *Virtual International Inorganic Chemistry Conference*, Nairobi, Kenya. 1st - 2nd Oct 2020.
3. **Immaculate L. A. Ouma**, Augustine E. Ofomaja, Eliazer B. Naidoo. Optimization of magnetite nanoparticle and pine cone based nanocomposite synthesis for water treatment. *9th International conference of the Africa Materials Research Society*, Gaborone, Botswana. 11th - 14th Dec 2017.
4. **Immaculate L. A. Ouma**, Augustine E. Ofomaja, Eliazer B. Naidoo. Manganese doping of iron oxide magnetic nanoparticles for arsenic adsorption: A response surface methodology optimization. *International Conference on Pure and Applied Chemistry*, Flic en Flac, Mauritius. 18th - 22nd July 2016.
5. **Immaculate L. A. Ouma**, Augustine E. Ofomaja, Eliazer B. Naidoo. Magnetic nanoparticles stabilized by lignocellulosic waste as green adsorbent for Cr(VI) removal from wastewater. *NanoMaterials for the Energy and Environment International Conference and Exhibition*, Paris, France. 1st - 3rd June 2016.
6. **Immaculate L. A. Ouma**, Augustine E. Ofomaja, Eliazer B. Naidoo. Biosorption of Cr (VI) from waste water using pine cone powder and iron oxide-pine cone powder nanocomposite. *The 42nd National Convention of the South African Chemical Institute*, Durban, South Africa. 29th Nov - 2nd Dec 2015.
7. **Immaculate L. A. Ouma**, Paul Mushonga, Abram M. Madiehe, Mervin Meyer, Francis B. Dejene, Martin O. Onani. Effect of reaction parameters on the growth and optical properties of PbSe nanocrystals. *The 7th International Conference of the Africa Materials Research Society*, Addis Ababa, Ethiopia. 8th - 13th Dec 2013.
8. **Immaculate L. A. Ouma**, Paul Mushonga, Abram M. Madiehe, Mervin Meyer, Martin O. Onani, Francis B. Dejene. Size and shape evolution of PbSe nanocrystals. *PACN congress on sustainability in Africa. Energy, water and waste*, Addis Ababa, Ethiopia. 3rd - 5th Dec 2013.
9. **Immaculate L. A. Ouma**, Paul Mushonga, Abram M. Madiehe, Mervin Meyer, Martin O. Onani, Francis B. Dejene. Synthesis, optical and morphological characterization of MPA-capped PbSe nanocrystals. *5th South African Conference on Photonic Materials*, Kariega Game Reserve, South Africa. 29th April - 3 May 2013.
10. **Immaculate L. A. Ouma**, Paul Mushonga, Abram M. Madiehe, Mervin Meyer, Martin O. Onani, Francis B. Dejene. Synthesis, optical and morphological characterization of doped PbX/PbS (X=Se, Te) quantum dots for diagnostic studies: A model study. *1st Pan African Summer school on Nanomedicine*, Pretoria, South Africa. 4th - 10th Nov 2012.

Referees

- 1.** Dr. John Makokha
Kibabii University
P. O. Box 1699,
Bungoma, 50200
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- 2.** Prof. Martin Onani
University of the Western Cape
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- 3.** Prof. Bobby Naidoo
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