TENDAI GADZIKWA, Ph.D.

CURRICULUM VITÆ

Associate Professor
Department of Chemistry, Kansas State University
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CURRENT POSITION

Kansas State University, Manhattan, KS, USA

Associate Professor. Of Chemistry — 2023 – present

Assistant Professor of Chemistry — 2016 – 2023

EDUCATION

Northwestern University, Evanston, IL, USA
Ph.D., Chemistry
Engendering structural and chemical diversity in metal-organic framework materials via ligand elaboration and post-synthesis modification — 2003 – 2009
Advisors: Prof. Joseph T. Hupp & Prof. SonBinh T. Nguyen

Macalester College, St. Paul, MN, USA
B.A. *Magna cum Laude*, Chemistry — 1999 – 2003

PROFESSIONAL EXPERIENCE

University of Zimbabwe, Senior Lecturer
Chemistry Department, Harare, Zimbabwe — 2012 – 2015

RESEARCH EXPERIENCE

University of Alberta, Visiting Scholar
Department of Chemistry, Edmonton AB, Canada
Chemical ligation for enzyme-free DNA amplification — 2015 – 2016
Principal collaborator: Assoc. Prof. Julianne Gibbs-Davis

University of Amsterdam, Schlumberger FFTF Postdoctoral Fellow
van 't Hoff Institute of Molecular Sciences, Amsterdam, The Netherlands
Supramolecular strategies for enantioselectivity in homogeneous catalysis — 2009 – 2011
Advisor: Prof. Joost N. H. Reek

AWARDS & HONORS

NSF Faculty Early Career Development Program (CAREER) Award	2023
K-State Office for the Advancement of Women in Science & Engineering (KAWSE) Advance Distinguished Scholar Lecture Award	2017 & 2020
IONiC (Interactive Online Network of Inorganic Chemists) VIPEr Fellow	2020
65th Lindau Nobel Laureate Meeting Horst-Köhler Fellow, Lindau, Germany	2015
University of Alberta Visiting Scholar Grant	2013
Schlumberger Faculty for the Future Postdoctoral Fellowship	2008
International Center for Materials Research Travel Grant	2006
American Institute of Chemists Student Award	2003
Howard Hughes Medical Institute Research Grant Award	2002
ACS Division of Analytical Chemistry Undergraduate Award	2002
Macalester College Dewitt Wallace Scholarship	1999

RESEARCH

FUNDING

1. National Science Foundation: CAREER: Confinement Effects & Emergent Reactivity in Multifunctional Metal-Organic Framework (MOF)-Based Catalysts. Award #2240021.
   Principal Investigator; $779,556
   07/2023–06/2028
2. Johnson Center for Basic Cancer Research: Metal-Organic Framework (MOF) Materials as Scaffolds for Multifunctional Drug Delivery Systems.
   Principal Investigator; $19,560
   05/2022–04/2023
3. National Science Foundation: Enzyme-inspired Catalysis in Multifunctional Metal-organic Framework Materials. Award #1800517.
   Principal Investigator; $425,000
   07/2018–06/2022 (no-cost extension of 12 months)
4. The World Academy of Sciences (TWAS): Metal-organic framework materials on Paper for Paper-Based Analytical Devices. Award #12-015 RG/CHE/AF/AC_I.
   Principal Investigator; $15,000
   Period Covered: 08/2013–02/2015

PUBLICATIONS (*Undergraduate researchers underlined*)

Independent Career

7. Frontier Article: Gadzikwa, T.; Matseketsa, P. "The covalent post-synthesis modification of MOFs for catalysis" *Dalton. Trans.* **2024**. DOI: 10.1039/D4DT00514G
6. Matseketsa, P.; Mafukidze, D.; Pothupitiya, L.; Averkiev, B. B.; Gadzikwa, T. "Unexpected reversal of reactivity in organic functionalities when immobilized together in a metal-organic framework (MOF)" *Mol. Syst. Des. Eng.* **2024**. DOI: 10.1039/D3ME00185G
5. News & Views: Gadzikwa, T. "Interweaving different metal–organic frameworks" *Nat. Chem.* **2023**, *15*, 1324-1326.
4. Samarakoon, K. P.; Yazdanparast, M.; Day, V. W.; Gadzikwa, T.* "Uniform and Simultaneous Orthogonal Functionalization of a Metal-Organic Framework Material," *Mol. Syst. Des. Eng.* **2020**, *5*, 804-808.
3. Yazdanparast M.; Day, V. W.; Gadzikwa, T.* "Hydrogen-Bonding Linkers Yield a Large-Pore, Non-Catenated, Metal-Organic Framework with pcu Topology," *Molecules* **2020**, *25*, 697.
2. Samarakoon, K. P.[†]; Satterfield, S. C.[†]; McCoy, M. C.; Pivaral-Urbina, D. A.; Islamoglu, T; Day, V. W.; Gadzikwa, T.* "Uniform, binary functionalization of a metal-organic framework material," *Inorg. Chem.* **2019**, *58*, 8906-8909.
1. Osman, E. A.; Gadzikwa, T.*; Gibbs-Davis, J. M.* "Quick Click: The DNA-Templated Ligation of 3′-O-Propargyl and 5′-Azide Modified Strands Is As Rapid and More Selective Than Ligase" *ChemBioChem* **2018**, *19*, 2081-2087. (VIP Paper; Cover Feature).

Postdoc, Graduate, and Undergraduate Career

11. Kausar, A.; Osman, E. A.; Gadzikwa, T.; Gibbs-Davis, J. M. "The presence of a 5′-abasic lesion enhances discrimination of single nucleotide polymorphisms while inducing an isothermal ligase chain reaction," *Analyst* **2016**, *141*, 4272-4277.
10. Lam, M. K.; Gadzikwa, T.; Nguyen, T.; Kausar, A.; Alladin-Mustan, B. S.; Sikder, M. D.; Gibbs-Davis, J. M. "Tuning toeholds and temperature to achieve rapid, colorimetric detection of DNA from the disassembly of DNA-gold nanoparticle aggregates," *Langmuir* **2016**, *32*, 1585-1590.
9. Gadzikwa, T.; Bellini R.; Dekker, H. L.; Reek, J. N. H. "Self-assembly of a confined rhodium catalyst for asymmetric hydroformylation of unfunctionalized internal alkenes," *J. Am. Chem. Soc.* **2012**, *134*, 2860-2863.
8. Dydio, P. F.; Rubay, C.; Gadzikwa, T.; Lutz, M.; Reek, J. N. H. "'Cofactor'-controlled enantioselective catalysis," *J. Am. Chem. Soc.* **2011**, *133*, 17176-17179.

7. Gadzikwa, T.; Farha, O. K.; Malliakas, C. D.; Kanatzidis, M. G.; Hupp, J. T.; Nguyen, S. T. “Selective bifunctional modification of a non-catenated metal-organic framework material via “click” chemistry,” *J. Am. Chem. Soc.* **2009**, *131*, 13613-13615.
6. Gadzikwa, T.; Farha, O. K.; Mulfort, K. L.; Hupp, J. T.; Nguyen, S. T. “A Zn-based, pillared paddlewheel MOF containing free carboxylic acids via covalent post-synthesis elaboration,” *Chem. Commun.* **2009**, 3720-3722.
5. Gadzikwa, T.; Lu, G.; Stern, C. L.; Wilson, S., R.; Hupp, J. T.; Nguyen, S. T. “Covalent surface modification of a metal-organic framework: Selective surface engineering via CuI-catalyzed Huisgen cycloaddition.” *Chem. Commun*. **2008**, 5493-5495.
4. Gadzikwa, T.; Zeng, B.; Hupp, J. T.; Nguyen, S. T. “Ligand-elaboration as a strategy for engendering structural diversity in porous metal-organic framework compounds.” *Chem. Commun*. **2008**, 3672-3674.
3. Pentzer, E; Gadzikwa, T.; Nguyen, S. T. “Substrate Encapsulation: An Efficient Strategy for the RCM Synthesis of Unsaturated ε-Lactones.” *Org. Lett*. **2008**, *10*, 5613–5615.
2. Cho, S. H.; Gadzikwa, T.; Afshari, M.; Nguyen, S. T.; Hupp, J. T. “[Bis(catechol)salen]Mn III coordination polymers as support-free heterogeneous asymmetric catalysts for epoxidation.” *Eur. J. Inorg. Chem.* **2007**, *2007*, 4863-4867.
1. Mio, M. J.; Kopel, L. C.; Braun, J. B.; Gadzikwa, T. L.; Hull, K. L.; Brisbois, R. G.; Markworth, C. J.; Grieco, Paul A. “One-pot synthesis of symmetrical and unsymmetrical bisarylethynes by a modification of the Sonogashira coupling reaction.” *Org. Lett.* **2002**, *4*, 3199-3202.

INVITED ORAL PRESENTATIONS

2023: Texas Pore Engineering Conference (Denton, TX).
Alliance for Diversity in Science and Engineering Young Researcher Conference (College Station, TX).
Great Plains Catalysis Society (GPCS) – Webinar Series. *Virtual.*
Department of Chemistry, University of Oklahoma (Norman, OK).

2022: Department of Chemistry, University of Nebraska, Omaha (Omaha, NE).
Department of Chemistry & Biochemistry, Texas Tech University (Lubbock, TX).
Department of Chemistry, University of North Carolina at Charlotte (Charlotte, NC).
264th ACS National Meeting, Emerging Areas in Inorganic Chemistry (Chicago, IL).
Department of Chemistry, University of Iowa (Iowa City, IA).
Department of Chemistry, Pittsburg State University (Pittsburg, KS).
Keynote – 3rd Africans in STEM Symposium (Cambridge, UK). *Virtual.*

2021: ***Keynote*** – Virtual Pan-African Conference on Crystallography (Johannesburg, RSA). *Virtual.*
Department of Chemistry, University of South Dakota (Vermillion, SD). *Virtual*.
American Chemical Society, Wichita Section (Wichita, KS).
Canadian Chemistry Conference and Exhibition (Winnipeg, MB, Canada). *Virtual*.
Inaugural Speaker – NOBCChE Lecture, University of Michigan (Ann Arbor, MI). *Virtual.*
Department of Chemistry & Chemical Biology, McMaster University (Hamilton, ON, Canada). *Virtual.*
Complex Systems in Synthesis & Catalysis Lab, University of Strasbourg (Strasbourg, France). *Virtual.*

2020: Department of Chemistry, Macalester College (St Paul, MN). *Virtual.*
Department of Chemistry & Biochemistry, Siena College (Loudonville, NY). *Virtual.*
Inorganic Seminar, Department of Chemistry, University of Delaware (Newark, DE). *Virtual.*
Johnson Group Seminar Series, Department of Chemistry, MIT (Boston, MA). *Virtual*.
Telluride Workshop: Accelerating Reaction Discovery (Telluride, CO). *Cancelled due to COVID-19*.
Department of Biochemistry and Molecular Biophysics, Kansas State University (Manhattan, KS).

2019: Gordon Research Conference, Nanoporous Materials and Their Applications (Andover, NH)
Department of Chemistry, Fort Hays State University (Hays, KS)

2018: MOF2018: Metal-Organic Frameworks and Open Framework Compounds (Auckland, New Zealand)
53rd ACS Midwest Regional Meeting (Ames, IA)
Department of Chemistry, Missouri State University (Springfield, MS)
Department of Chemistry, Wichita State University (Wichita, KS)

2017: Midwest Organic Solid-State Chemistry Symposium XXVII (Manhattan, KS)
Department of Chemistry, University of Nebraska, Kearney (Kearney, NE)
Department of Chemical Engineering, Kansas State University (Manhattan, KS)
Department of Chemistry, University of Nebraska, Omaha (Omaha, NE)
Department of Chemistry, Benedictine College (Atchison, KS)
Department of Chemistry, Pittsburg State University (Pittsburg, KS)

2016: Department of Chemistry, University of Nevada (Reno, NV)

2015: Department of Chemistry, Kansas State University (Manhattan, KS)
Department of Chemistry, University of Cape Town (Rondebosch, South Africa)

2013: Nanotechnology Innovation Centre, Rhodes University (Grahamstown, South Africa)

2010: Supramolecular Chemistry Group, University of Cape Town (Rondebosch, South Africa)

TEACHING

COURSES

Kansas State University

- CHM657: Inorganic Techniques. Undergraduate/graduate. (Fall 2016, 2017)
- CHM711: Inorganic Chemistry 1. Undergraduate/graduate. (Fall 2018, 2019, 2020, 2021)
- CHM712: Inorganic Chemistry 2. Undergraduate/graduate. (Spring 2017, 2018)
- CHM929: Physical Methods in Inorganic Chemistry. Graduate. (Spring 2019, 2020, 2021, 2022)

University of Zimbabwe

- CH103: Organic Chemistry 1 (2nd Semester 2012)
- CH201: Physical Chemistry 2 (1st Semester 2012)
- CH207: Production Chemistry Undergraduate (2nd Semester 2013)
- CH301: Physical Chemistry 3 (1st Semester 2012; 2013)
- CH302: Inorganic Chemistry 3 (2nd Semester 2012; 2013)
- CH310: Solid State Chemistry (2nd Semester 2012)

Honours:

- HCH101: Physical Chemistry 1 (2nd Semester 2013, 2014, 2015)
- HCH108: Materials Chemistry (2nd Semester 2013)
- HCH201: Quantum Mechanics & Spectroscopy (1st Semester 2013, 2014)
- HCH207: Molecular Modeling & Computational Chemistry (2nd Semester 2014, 2015)
- HCH209: Surface Chemistry. (2nd Semester 2014, 2015)
- HCH210: Solid State Chemistry (1st Semester 2014)
- HCH311: Advanced Physical Chemistry (1st Semester 2012; 2013)

Masters:

- MCH522: Advanced Inorganic Chemistry (1st Semester 2014)

MENTEES – CURRENT

- Ph.D.: Ms. Pricilla Matseketsa (2019 –); Mr. Ishara Pothupitiya (2021 –); Ms. Margret Pagare (2021 –); Mr. Terrell Campbell (2022–); Mr. Lamontain Udube (2023–).
- Undergrauate: Mr. Ryan Pierce (2023 –); Ms. Destiny Smith (2023 –); Ms. Unity Nebesniak (2023 –).

MENTEES – FORMER

- Postdoc: Dr. Mohammad Yazdanparast (2019 – 2020); Dr. Donovan Mafukidze (2021 – 2022).
- Ph.D.: Ms. Kanchana P. Samarakoon (2016 – 2022).
- D.Phil. (UZ): Ms. Sharon Mbera (2014 – 2015).
- M.Sc.: Mr. Christopher S. Satterfield (2016 – 2018); Ms. Taylor Perkins (2019 – 2021).
- Undergraduate: Ms. Mechelle C. McCoy (2017 – 2018); Mr. Patrick Gillespie (2017 – 2018); Ms. Monika Perez (2017 – 2018); Mr. Joel Brejda (2018 – 2019); Mr. Daniel A. Pivaral-Urbina (2017 – 2021); Ms. Amanda Currie (2020 – 2022); Ms. Pax Otuonye (2020 – 2023); Ms. Karrin Larson (2021 – 2023).
- REU: Mr. Francis Kitaka (2017); Mr. James Brenton (2018); Mr. Terrell Campbell (2021).

GUEST LECTURES

- CHM200: Frontiers in Chemistry. Introducing undergraduates to metal-organic framework materials and the research conducted in the Gadzikwa Lab. 2017 – present.
- HIST311: Race & US Foreign Relations. Discussing the film "Black Panther" and its importance as a commentary on relations of the African diaspora with Africa/Africans. 2020.
- ENG580: Selected World Literature. Discussing the Zimbabwean book "Nervous Conditions" and providing context on modern Shona culture and the Rhodesian education system. 2020.
- K-State Department of English, Writing Center. Lecture on the topic of Science Writing, discussing the conventions of science publication and the concerns shared by both student and faculty science writers.
- EDCEP111: The University Experience. Discussing with mostly 1st generation students what is involved in becoming a scientist, and possible career opportunities. 2017.

SERVICE

REVIEWING

- National Science Foundation – CHE and DMR (USA)
- Petroleum Research Fund (USA)
- Netherlands Organization for Scientific Research (Netherlands)
- National Research Foundation (South Africa)
- National Science Center (Poland)
- Research Council of Zimbabwe (Zimbabwe)
- Article review: ACS Sus. Chem. Eng.; Chem. Catal.; Colloids Surf. A; J. Am. Chem. Soc.; Nat. Chem.
- Book review: CRC Press (book proposal); Royal Society of Chemistry (book chapter)

DEPARTMENTAL COMMITTEES

- Member: Executive Committee — 2022 – present
- Member: Research Restructuring Committee — 2022 – present
- Member: Committee for High School Engagement — 2022 – present
- Member: Diversity, Equity, and Inclusion Committee — 2021 – present
- Member: Faculty Search Committees — 2016 – present
- Member: NMR Users Committee — 2012 – 2022
- Chair: Open House Committee — 2019 – 2022
- Member: Graduate Admissions & Recruiting Committee — 2016 – 2022

SERVICE TO SCIENCE COMMUNITY

- American Chemical Society (**ACS**) — 2019 – present
  - Kansas State University Local Section Councillor — 2018 – 2019
  - Kansas State University Local Section President — 2019
  - Midwest Regional Meeting (MWRM) symposium organizer
- National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (**NOBCChE**) — 2020 – present
  - Founder & Faculty Advisor of K-State Student Chapter — 2020 – present
  - Mentor for national organization — 2018 – present
- Faculty Advisor: Alpha Chi Sigma (**ΑΧΣ**), K-State Student Chapter — 2019 – present
- Mentor: Chemistry Women Mentorship Network (**ChemWMN**) — 2014 – 2015
- Founder & Co-Boss: Nerd Nite Harare (**NN-HRE**) — 2014
- Member: Zimbabwe Council for Higher Education (**ZCHE**) working group for the development of Materials Science graduate programs — 2012 – 2014
- Member: Standards Association of Zimbabwe (**SAZ**) Technical Committee

SCIENCE COMMUNICATION & OUTREACH

- Featured Scientist: Greene, N. *How to Watch Basketball Like a Genius: What Game Designers, Economists, Ballet Choreographers, and Theoretical Astrophysicists Reveal About the Greatest Game on Earth*; Harry N. Abrams: New York, 2021.
- Facilitator: Girls Researching Our World (GROW) and Exploring Science, Technology, and Engineering (EXCITE). STEM Activities for high- and middle-school girls organized by the K-State Office for the Advancement of Women in Science & Engineering (KAWSE). 2017 – present.
- Presenter: Skype a Scientist virtual presentations to US and Canadian K-12 schools. 2019 – present.
- Facilitator: Chemistry display and show at the STEM Family Fun Night for elementary school students at the Flint Hills Discovery Center. 2017 – present.
- Speaker: Science-on-Tap/Science Communication Week public talk organized by the Sunset Zoo and the Kansas Science Initiative. 2019.
- Facilitator: Chemistry activity for Rock Creek High School Girls STEM Camp hosted at K-State. 2019.
- Presenter/Co-organizer: Physics & Chemistry Symposium for high school students at K-State. 2018.
- Speaker: Nerd Nite public talks for NN-YEG (Edmonton, 2015) and NN-HRE (Harare, 2014).
- Programming Mentor & Coach: Technovation Challenge international app-building competition for girls. Mentored the college team that was the 2014 National Winner and taught basic programming to all K-12 teams (Harare, ZWE). 2014 – 2015.
- Facilitator: Hour of Code week hosted by the Hypercube Hub (Harare, ZWE). 2014.