



ABDULMAJEED ABDULLAH ALAYYAF
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EDUCATION

Ph.D. in Chemistry Oklahoma State University, Stillwater, OK, USA	July 2021
Master of Science in Chemistry East Tennessee State University, Johnson City, TN, USA	May 2016
Bachelor of Chemistry King Saud University, Riyadh, Kingdom of Saudi Arabia	May 2010

RESEARCH EXPERIENCE

Research (Ph.D.): Oklahoma State University Thesis Title: Synthesis, Characterization, and Catalytic Application of Nanocrystalline Transition Metal Oxides	Fall 2016-Summer 2021
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Synthesized, characterized and applied transition metal oxides nanoparticles catalysts that, are not only important to synthesize intermediate organic compounds such as chalcone synthesis but it also has useful applications in other areas of chemical syntheses like benzaldehyde oxidation.

Research (M.S.): East Tennessee State University Thesis Title: Synthesis of a 3-Fluoro-4-Diazonium Perfluoroalkyl Benzenesulfonylimide (PFSI) Zwitterionic Monomer and 5-nitro-1,3-benzenedisulfonyl amide for Proton Exchange Membrane Fuel Cells	Fall 2013-May 2016
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Investigated practical ways to synthesize compounds that can form diazonium group to be easily lost to form covalent bond and can be polymerized and used as electrolyte in Polymer Electrolyte Membrane Fuel Cells.

Research (B.S.): King Saud University Thesis Title: Synthesis and Analysis of solid Reaction by Microwave of Some Imines	Spring 2010
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Applied Microwave to make solvent free imines from aldehydes and ketones then characterize them via NMR and IR.

TEACHING EXPERIENCE

Assistant Professor, King Saud University, Riyadh, Kingdom of Saudi Arabia Fall 2021-Present

- Lecturer



- Instructed organic chemistry laboratory
- Instructed research students
- Ensured that safety procedures are followed

Teaching Assistant, Oklahoma State University, Stillwater, OK, USA

Spring 2017

- Instructed general chemistry laboratory
- Ensured that safety procedures are followed

Teaching Assistant, King Saud University, Riyadh, Kingdom of Saudi Arabia

Fall 2010

- Instructed general chemistry laboratory
- Ensured that safety procedures are followed
- Worked with chemistry department administration

PRESENTATIONS AND PUBLICATIONS

- Alayyaf, A.A.; Barakat, A.; Al-Majid, A.M.; Ali, M.; Yousuf, S.; Haukka, M.; El-Faham, A.; Soliman, S.M.; Nafie, M.S. Cytotoxicity and Apoptosis-Induction in MCF-7 Cells for New Pd(II) Complex Based on *s*-Triazine Ligand: Synthesis, Single Crystal X-ray Diffraction Analysis and Structural Investigations. *Crystals* **2023**, *13*, 1472.
<https://doi.org/10.3390/cryst13101472>
- Al-Jassas, R. M.; Islam, M. S.; Al-Majid, A. M.; Nafie, M. S.; Haukka, M.; Motiur, A. F. M.; Alayyaf, A. M. A.; Barakat, A. *Arch. Pharm.* **2023**, 356.
<https://doi.org/10.1002/ardp.202300185>
- ACS Fall 2021 National Meeting & Exposition, Atlanta, GA August 2021
Nanocrystalline Metal Oxides for Benzaldehyde Oxidation to Benzoic Acid
- ACS Spring 2021 National Meeting & Exposition April 2021
Kinetic Investigation of the Claisen-Schmidt Condensation for Production of Chalcone Using Basic Metal Oxide Catalysts
- ACS Spring 2021 National Meeting & Exposition April 2021
Effect of the Preparation Method on the Surface Chemistry and Surface Morphology of Metal Oxide Nanoparticles
- MWRM 2020 ACS regional meeting, Springfield, MO October 2020
Synthesis and Applications of Nanometric Late Transition Metal Oxides
- ACS Fall 2020 Virtual Meeting & Exposition August 2020
Aldol Condensation and Intramolecular Reactions Catalyzed by Green Catalysts of Nanometric Metal Oxides
- 24th Annual Green Chemistry & Engineering Conference June 2020
Nanometric Metal Oxides Green Catalysts as Replacement of the Hazardous Brønsted Acids and Bases
- ACS Spring 2020 National Meeting & Exposition, Philadelphia, PA March 2020
Surface Characterization and Applications of Catalytic Ceramic Metal Oxide Nanoparticles Catalysts
- ACS Spring 2020 National Meeting & Exposition, Philadelphia, PA March 2020
Kinetic Investigation of the Condensation Reaction of Aromatic Aldehydes with Acetophenone Using Lewis Base Catalysts



- MWRM 2019 ACS regional meeting, Wichita, KS October 2019
Pyruvic Acid Oxime and Oxalate Precursors for Production of Nanocrystalline Metal Oxide Catalysts
- 64th Annual Oklahoma Pentasectional Meeting of the American Chemical Society, Norman, OK April 2019
Metal Oxides Nanoparticles Catalysts for Carbon-Carbon Bond Formation and Intermolecular Rearrangement Reactions
- 257th ACS National Meeting & Exposition, Orlando, FL March 2019
Metal Oxide Nanoparticles as Catalysts for Chalcone and Intermolecular Cyclization Reactions
- 256th ACS National Meeting & Exposition, Boston, MA August 2018
Heterogeneous Nanocrystalline Metal Oxide Catalysts for Aldol Condensations Derived from Pyruvic Acid Oxime and Oxalate Precursors
- 63rd Annual Oklahoma Pentasectional Meeting of the American Chemical Society, Tulsa, OK April 2018
Nanocrystalline Late Transition Metal Oxides as Catalysts for the Synthesis of Trans-Chalcone
- Midsouth Inorganic Chemists Association, Stillwater, OK March 2018
Investigation Metal Oxides Nanoparticle as Highly Efficient and Selective Catalysts for Preparation of Trans-Chalcones
- Mei, H.; Nworie, C.; Abban, G.; Alayyaf, A.; McCloud, R., Diazonium (perfluoroalkyl) arylsulfonylimide zwitterionic monomer analogues: Effective synthesis and thermal stability. *International Journal of Hydrogen Energy* **2016**, 41 (5), 3628-3637.
- 2016 Appalachian Student Research Forum, Johnson City, TN April 2016
Synthesis Of 5-nitro-1, 3-benzenedisulfonylamide Monomer For Proton Exchange Membrane Fuel Cells (PEMFCs)
- 2014 Appalachian Student Research Forum, Johnson City, TN April 2014
One Analogue Of Diazonium Perfluoroalkyl Benzenesulfonylimide (PFSI) Zwitterionic Monomers For Proton Exchange MEMBRANE Fuel Cells

PROFESSIONAL DEVELOPMENT

- **Instrumentations:** Ultraviolet Visible (UV-Vis), Fourier Transform Infrared (FTIR), Raman, Fluorescence, Thermogravimetric Analysis (TGA), Differential Scanning Calorimetry (DSC), Brunauer–Emmett–Teller (BET)
- **Interpretations:** X-ray Diffraction (XRD), X-ray Fluorescence (XRF), Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), X-ray Absorption Spectroscopy (XAS)
- **Chromatography:** Gas Chromatography-Mass Spectrometry (GC-MS), Thin Layer chromatography (TLC), Column chromatography
- **Nuclear Magnetic Resonance (NMR):** liquid, Solid State
- **Techniques:** Schlenk line, Glovebox, Rotary evaporator, grow crystals, synthesis and separation techniques

ACTIVITIES AND COMMUNITY INVOLVEMENT



American Chemical Society	2015-Present
Active member of Islamic Society of Stillwater	2016-2021
Saudi Student Association at Oklahoma State University	2017-2019
International Student Organization, East Tennessee State University	2013-2015
Saudi Student Association at East Tennessee State University	2013-2014
Arabian Chemical Society	2008-2011
Saudi Chemical Club, King Saud University	2008-2010
Student Organization Volunteer, King Saud University	2008-2009