Curriculum Vitae

Mohamed, Mahmoud Basseem Ibraheem
Assistant Professor
Address: Chemistry Department, Faculty of Science, Al-Azhar University
Nasr City 11884, Cairo Egypt
Email: mahmoudbasseem@azhar.edu.eg
Phone: +20 01123781102
Website: profbasseem.com
ORCID: https://orcid.org/0000-0001-5558-6342
Researcher ID: H-6123-2016
Scopus ID: 57208751639
Google Scholar: https://scholar.google.com/citations?user=V6_4ZtcAAAAJ&hlg
LinkedIn: https://www.linkedin.com/in/mahmoud-basseem-i-mohamed-38a77293/

Professional Summary

I am an Assistant Professor in the Chemistry Department, Faculty of Science, Al-Azhar University, Nasr City 11884, Cairo Egypt. I have a lot of experience teaching general and organic chemistry to students of all levels, both major and non-major. I am involved in various activities, such as developing the curriculum, providing academic advice, and conducting scientific research. My main research interests include sensors, nanomaterials, and polymer chemistry. Proven ability to work with people from other fields and help achieve academic and scientific success. I want to be a part of Alamein International University so that I may use my chemical knowledge to help its academic and research programs grow.

Education:

- **Data Science Diploma (2022)** in Machine Learning & Artificial intelligence
  Space Code Academy, Maadi, Cairo, Egypt.
- **Ph.D. in Organic Chemistry (2017)** entitled "Synthesis, Photophysical Properties and Study of Some Applications of New Derivatives of Xanthene Dyes".
  Department of Chemistry, Faculty of Science, Al-Azhar University, Nasr City 11884, Cairo Egypt.
- **Master of Science in Organic Chemistry (2014)** entitled "synthesis and evaluation of some acid dyes and its utilization in textile coloration".
  Department of Chemistry, Faculty of Science, Al-Azhar University, Nasr City 11884, Cairo Egypt.
- **Bachelor of Science in Chemistry (2008)**
  Department of Chemistry, Faculty of Science, Al-Azhar University, Nasr City 11884, Cairo Egypt.
  (Very Good with Honors) (81.33%).

Professional positions:

- **Assistant Professor** in Applied Organic Chemistry
  Department of Chemistry, Faculty of Science, Al-Azhar University, Nasr City 11884, Cairo Egypt.
  2023 - Present (*1 year 7 months*)
- **Lecturer** in Organic Chemistry
  Department of Chemistry, Faculty of Science, Al-Azhar University, Nasr City 11884, Cairo Egypt.
  2018 - 2023 (*5 years 7 months*)
- **Assistant Lecturer** in Organic Chemistry
  Department of Chemistry, Faculty of Science, Al-Azhar University, Nasr City 11884, Cairo Egypt.
  2015 - 2017 (*3 years 3 months*)
- **Demonstrator** in Organic Chemistry
  Department of Chemistry, Faculty of Science, Al-Azhar University, Nasr City 11884, Cairo Egypt.
  2012 - 2014 (*3 years 1 month*)

Research Interests

- **Design and Synthesis of Chemosensors:** Chemical species can be detected and monitored using chemosensors, which have biological and environmental applications.
- **Integration of Machine Learning and Artificial Intelligence in Chemical Research:** Optimizing chemical synthesis, predicting material properties, and improving data analysis in chemical research.
- **Development of Supramolecular Interactions:** To improve detection system sensitivity and selectivity, supramolecular interactions are studied and used to design new materials as solid chemosensors.
- **Development of Solid Polymer Chemosensors via Suzuki Coupling for Gas Detection:** To improve sensitivity, stability, and selectivity, developing and producing solid polymer-based chemosensors using Suzuki coupling processes to detect hazardous gases.
- **Design and Synthesis of Metal Complexes and Nanomaterials:** Sustainable and effective catalysis and wastewater treatment employing metal complexes and nanomaterials in environmental and industrial applications.
- **Photocatalytic Applications of Polymer/Metal-Oxide Nanocomposites:** Development and characterization of polymer/metal-oxide nanocomposites and semiconducting polymer nanoparticles to improve photocatalytic performance for environmental remediation and renewable energy production.
- **Electrochemical Studies of Organic and Inorganic Compounds:** Electrochemical studies of chemicals for energy storage, corrosion inhibition, and sensing applications.
- **Synthesis and Functionalization of Nitrogen-Containing Heterocyclic Compounds:** Synthesis and functionalization of nitrogen-containing heterocyclic molecules for advanced materials science, drug discovery, and medicinal chemistry.

Scientific and Teaching Activities

Teaching and Academic Supervision

Practical Courses:

- **Organic Chemistry for Undergraduate Students:** Training students in the identification of fundamental organic compounds in both pure and mixed forms, as well as the determination of their concentration using a variety of chemical and spectroscopic methods.

Theoretical Courses:

- Principles of Organic Chemistry.
- Advanced Organic Dye Chemistry.
- Carbohydrates.
- Organometallic Compounds.

Supervision of Academic Theses:

- **Master's Theses:**

1. Preparation and study of the properties of certain metal complexes within NaY zeolite cavities.
2. Developing semiconducting polymer nanoparticles as photocatalysts for wastewater treatment.
3. Development and Characterization of Polymer/Metal-Oxide nanocomposites for photocatalytic applications.

- **Ph.D. Theses:**

1. Development of solid adsorbent chemosensors based on organic and inorganic materials for the detection and removal of heavy metals from wastewater.
2. Electrochemical studies using different organic compounds.
3. Synthesis of nanoscale particles coated with cationic surfactants as corrosion inhibitors for steel coatings.
4. Synthesis of nitrogen-containing heterocyclic compounds and studying their applications.

Membership of Committees and Teams

- Member of the **Executive Office of the Quality Assurance Unit**, Faculty of Science, Al-Azhar University.
- Member of the **Distance Learning Team**, Faculty of Science, Al-Azhar University.
- Member of the **Theoretical Examinations Committee**, Faculty of Science, Al-Azhar University.
- Member of the **Study Schedules Committee** at the Chemistry Department, responsible for organizing teaching duties and timetables.

Conferences and workshop

- Conference Paper in the 9th International Conference for Basic Sciences from 27 to 29 March **2017**, Cairo, Egypt, **Mahmoud Basseem I. Mohamed**, Taha M. Elmorsi, Tarek S. Aysha, Ahmed H. Bedair, "Synthesis of some Xanthene Dye Derivatives and used as a Copper Selective Colorimetric Chemosensor, Kinetics and Equilibrium Study". (Oral)
- Participate in the first international conference on Imaging and mapping Techniques and its Applications (ICIMATA **2019**), which hold on the 21st of November **2019**, In Grand Nile Tower Hotel (Ekhnaton Hall), Cairo, Egypt.
- Attending the Web of Science Seminar on October 13th, **2019,** at Al-Azhar University, Cairo that was attended by The Web of Science Group one of A Clarivate Analytics company.
- Attending workshop by cooperation between faculty of science (girls) and Technological Incubator, Al-Azhar University in the title: "Potentiostat/Galvanostate: techniques and applications" which hold on the 10th of June **2019**, in faculty of science (girls), Al-Azhar University, Cairo, Egypt.
- Participated in a seminar in the title: " Artificial Intelligence: Opportunities, Challenges, and Applications", organized by the Communications and Information Technology Research Council on September 18, **2023**, via Zoom.

Skills

- Advanced knowledge in spectroscopy, nanomaterials, and chemosensors.
- Able to use modern educational technologies and Learning Management Systems (LMS) like Microsoft Teams and Google Classroom, as well as programming languages like Python.
- Strong research capabilities, including scientific writing and publication.
- Effective communication and collaboration skills.

Patents

- **Mahmoud Basseem I. Mohamed**, Tarek S. Aysha, Mervat S. El-Sedik, Omaima M. T. Kandil, Shimaa T. A. Omara, Taha M. Elmorsi, Ahmed H. Bedair. "Fluorescence probe based on fluorescein derivatives for monitoring pH changes and their application in bio-imaging for the detection of dangerous bacteria." Patent application number 2019050760, filed in **2019**, accepted on August 30, **2023**, issued as patent number **865** in September **2023**.

Publications:

1. Mohamed Attia, **Mahmoud Basseem I. Mohamed**, Mohamed A. Hegazy, Mohamed M. Ghobashy, Farag Abdelhai. Design and Synthesis of a Phosphorus-Functionalized Acrylate Polymer for Enhanced Corrosion Resistance in UV-cured Coatings. Materials Chemistry and Physics, **2025**, 131007.
2. M. Attia, **Mahmoud Basseem I. Mohamed**, M. A. Hegazy, M. M. Ghobashy, H. Abd El-Wahab & F. Abdelhai. Enhancing corrosion resistance with chemically modified aluminum oxide in UV-curable coatings applied to steel surfaces. Sci Rep, **2025** 15, 16720.
3. Ahmed, A. S., **Mahmoud Basseem I. Mohamed**, Bedair, M. A., El-Zomrawy, A. A., & Bakr, M. F. Two electrochemical sensors based on pencil graphite electrodes modified with azo dye and a novel Schiff base for lead and cadmium ion quantification. Inorganic Chemistry Communications, **2024**, 112849.
4. El-Sedik, Mervat, **Mahmoud Basseem I. Mohamed**, Nadia Saad, Ahmed A. El-Rashedy, Karima Haggag, Gehan Safwat, and Tarek Aysha. "Synthesis, molecular dynamics, antimicrobial activity and wound healing application of new methylidene dyes based on pyrrolinone esters." Journal of Photochemistry and Photobiology A: Chemistry, **2024**, 454, 115733.
5. El-Sedik, Mervat S., **Mahmoud Basseem I. Mohamed**, Mohamed S. Abdel-Aziz, and Tarek S. Aysha. "Synthesis of New D–π–A Phenothiazine-Based Fluorescent Dyes: Aggregation Induced Emission and Antibacterial Activity." Journal of fluorescence **2024**, 1-12.
6. M. G. Abouelenein, **Mahmoud Basseem I. Mohamed**, M. M. Elsenety, A. A. El-Rashedy, S. H. Ghalib, F. A. E. Mohamed, N. M. A. El-Ebiary, A. A. Ageeli, Chem. Biodiversity **2024**, 21, e202301986.
7. Abdelrahman S. Ahmed, **Mahmoud Basseem I. Mohamed**, Mahmoud A. Bedair, Adham A. El-Zomrawy, Moustafa F. Bakr, A new Schiff base-fabricated pencil lead electrode for the efficient detection of copper, lead, and cadmium ions in aqueous media; RSC Adv., **2023**, 13, 15651-15666.
8. Albalawi, Fawzia F., Mohammed A. A. El-Nassag, Raafat A. El-Eisawy, **Mahmoud Basseem I. Mohamed**, Ahmed M. Fouda, Tarek H. Afifi, Ahmed A. Elhenawy, Ahmed Mora, Ahmed M. El-Agrody, and Heba K. A. El-Mawgoud, Synthesis of 9-Hydroxy-1H-Benzo[f]chromene Derivatives with Effective Cytotoxic Activity on MCF7/ADR, P-Glycoprotein Inhibitors, Cell Cycle Arrest and Apoptosis Effects. International Journal of Molecular Sciences, **2022**, 24, 1
9. Mohamed M. Elsenety, **Mahmoud Basseem I. Mohamed**, Mohamed E. Sultan, Badr A. Elsayed, Facile and highly precise pH-value estimation using common pH paper based on machine learning techniques and supported mobile devices; Scientific Reports, Voulme12, **2022**, 22584.
10. **Mahmoud Basseem I. Mohamed**, Mervat S. El-Sedik, Yehya A. Youssef, Tarek S. Aysha, New Stilbene-Biscarbothioamide Based Colorimetric Chemosensor and Turn on Fluorescent Probe for Recognition of Hg^{2+} Cation; Journal of Photochemistry and Photobiology A: Chemistry, Volume 433, **2022**, 114206.
11. Sameh Sobhy, Mohamed M. Elsenety, **Mahmoud Basseem I. Mohamed**, Yasser M. Moustafa, Tarek M. Salam, Molecular dynamic simulations for interactions of oxytetracycline with copper(II)-exchanged NaY zeolite, Inorganic Chemistry Communications, **2022**, 114, 109829.
12. Fatma A. Mohamed, Mahmoud B. Sheier, Maysa M. Reda and Hassan M. Ibrahim, Synthesis, Application, and Antibacterial Activity of New Direct Dyes based on Chromene Derivatives, Current Organic Synthesis, **2022**, 19, 757.
13. Ahmed Ragab, Yousry A. Ammar, Ahmed Ezzat, Ammar M. **Mahmoud Basseem I. Mohamed**. Mohamed, Abdou S. El_Tabl, Rabie S. Farag, Synthesis, characterization, thermal properties, antimicrobial evaluation, ADMET study, and molecular docking simulation of new mono Cu(II) and Zn(II) complexes with 2 oxoindole derivatives, Computers in Biology and Medicine, **2022**, 145, 105473.

14. Ahmed Ezzat, **Mahmoud Basseem I. Mohamed**, Ammar M. Mahmoud, Rabie S. Farag, Abdou S. El_Tabl, Ahmed Ragab, Synthesis, spectral characterization, antimicrobial evaluation and molecular docking studies of new Cu(II), Zn(II) thiosemicarbazone based on sulfonyl isatin, Journal of Molecular Structure, **2022**, 5, 132004.
15. Mohamed A. Gebril, Mahmoud A. Bedair, Samir A. Soliman, Moustafa F. Bakr, **Mahmoud Basseem I. Mohamed**, Experimental and computational studies of the influence of non-ionic surfactants with coumarin moiety as corrosion inhibitors for carbon steel in 1.0 M HCl, Journal of Molecular Liquids, **2022**, 349, 118445.
16. Tarek S. Aysha, **Mahmoud Basseem I. Mohamed**, Mervat S. El-Sedik and Yehya A. Youssef, Multi-functional colorimetric chemosensor for naked eye recognition of Cu^{2+}, Zn^{2+} and Co^{2+} using new hybrid azo-pyrazole/pyrrolinone ester hydrazone dye, Dyes and Pigments, **2021**, 196, 109795.
17. **Mahmoud Basseem I. Mohamed**, Tarek S. Aysha, Taha M. Elmorsi, Ahmed H. Bedair, A highly sensitive colorimetric chemosensor and turn on fluorescence probe for pH monitoring and bio-imaging application in living cells, Journal of Fluorescence, **2020**, 30, 601–612.
18. Tarek S. Aysha, Mervat S. El-Sedik, **Mahmoud Basseem I. Mohamed**, Samir T. Gaballah, Mona M. Kamel, Dual functional colorimetric and turn-off fluorescence probe based on pyrrolinone ester hydrazone dye derivative for Cu^{2+} monitoring and pH change, Dyes and Pigments, **2019**, 170, 107549.
19. A.H. Bedair, A.S. El-Tabei, M.A. Hegazy, **Mahmoud Basseem I. Mohamed**, M. A. Sadeq, The utility of michael condensation for the synthesis of macromolecule surfactants from azo-naphthols as possible antimicrobials, Al-Azhar Bulletin of Science, **2019**, 30(2), 17-26.
20. Taha M. Elmorsi, Tarek S. Aysha, O. Machalický, **Mahmoud Basseem I. Mohamed**, Ahmed H. Bedair, A dual functional colorimetric and fluorescence chemosensor based on benzo[f]fluorescein dye derivatives for copper ions and pH; kinetics and thermodynamic study, Sensors Actuators B Chem., **2017**, 253, 437–450.
21. Taha M. Elmorsi, Tarek S. Aysha, **Mahmoud B. Sheier**, Ahmed H. Bedair, Synthesis, Kinetics, and Equilibrium Study of Highly Sensitive Colorimetric Chemosensor for Monitoring of Copper Ions based on Benzo[f]fluorescein Dye Derivatives, Zeitschrift Fur Anorg. Und Allg. Chemie, **2017**, 643, 811–818.
22. Mahmoud S. Bashandy, Fatma A. Mohamed, Mohamed M. El-Molla, **Mahmoud B. Sheier**, Ahmed H. Bedair, Synthesis of Novel Acid Dyes with Coumarin Moiety and Their Utilization for Dyeing Wool and Silk Fabrics, Open J. Med. Chem., **2016**, 6, 18–35.
23. Fatma A. Mohamed, Mahmoud S. Bashandy, H. Abd El-Wahab, **Mahmoud B. Sheier**, Mohamed M. El-Molla, Ahmed H. Bedair, Synthesis of Several Newly Acid Dyes and their Application in Textile Dyeing, Int. J. Adv. Res., **2014**, 2, 248–260.

Certifications

- **Self-Institution Assessment** - Quality Assurance & Training Center - Al-Azhar University
- **Curriculum Mapping and Course Description** - Quality Assurance & Training Center - Al-Azhar University.
- **Student Evolution** - Quality Assurance & Training Center - Al-Azhar University.
- **Effective Presentation Skills** - Quality Assurance & Training Center - Al-Azhar University.
- **Research Design Skills** - Quality Assurance & Training Center - Al-Azhar University.

Research Projects

- **2025-2028 (Co-PI)**

  The project number: **51011** (*Development of Solid Adsorbent Chemosensors Based on Organic and Inorganic Materials for the Detection and Removal of Heavy Metals from Wastewater*).

- **2022-2024 (Member)**

  The project number: **13711505** (*Development of Solid Polymer Chemosensors via Suzuki Coupling for the Detection of Harmful Gases*).

- **2019-2021 (Member)**

  The project number: **12010205** (*Process development and optimization of indigo dying for adding value denim blend fabrics*).

- **2019-2021 (Member)**

  The project number: **12010305** (*Colorimetric chemosensors for recognition of explosives and dangerous materials*).

- **2016-2018 (Member)**

  The project number: **11070103** (*colorimetric chemosensors and fluorescence probes: a promising strategy for environmental monitoring of ionic species and toxic gases*).

Program Projects

- Designer and Developer of the "**Academic Scheduling Management System**" https://profbasseem.com/projects/Academic_Scheduling_Management_System, a digital platform designed to efficiently and fairly manage and distribute teaching workloads among faculty and chemistry department members.

Reviewer at journals

- Heliyon
- Journal of Fluorescence
- Scientific Reports
- Membranes
- Sensors