
Mamoun M. Bader, Ph.D.

Professor of Chemistry

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Education

- **Ph.D., Chemistry** – University of Southern California, Los Angeles, California, USA
1990
 - **B.Sc., Chemistry, and Physics (with Excellence)** – Qatar University, 1985
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Professional Summary

I am a seasoned academic leader with over 27 years of experience in higher education, specializing in chemistry, strategic planning, and student-centered curriculum development. Extensive background in guiding research and academic departments, implementing pedagogical innovations, and spearheading student advising and success initiatives. Recognized for commitment to building collaborative research and scholarly communities, advancing faculty and staff development, and fostering environments that enhance staff retention, success, and excellence in quality research output.

Professor and researcher with over 27 years of experience in teaching, research, and student mentorship in the fields of nonlinear optics, optical properties of organic materials chemistry, solid-state chemistry, and electrochemistry. Proven track record of developing innovative, research-based curricula and laboratory experiments that bridge theoretical knowledge with real-world applications. Recognized for contributions in mentoring researchers, and students and advancing research in molecular crystals, drug polymorphism, and optical, and biological biomarkers, optical & electrochemical biosensors, and organic semiconductors

Leadership Experience in Higher Education

Professor of Chemistry (2013–Present)

Vice Provost for Academic Affairs (May 2013–Oct. 2014)

- **Strategic Planning:** Led the university's strategic planning committee, developing a comprehensive plan that aligned academic priorities with institutional goals and secured faculty and administrative buy-in.
 - **Curriculum Development:** Oversaw the restructuring of core chemistry courses and developed new curricula, including advanced research-based laboratory modules for undergraduates.
 - **Faculty Development:** Initiated workshops on best practices in teaching, learning, and lab safety; authored a faculty booklet on pedagogical methods to enhance instructional quality.
 - **Student Engagement:** Launched student-centered initiatives that focused on mentorship, retention, and advising, especially targeting at-risk students in their first year, which significantly improved student success rates.
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Pennsylvania State University, Hazleton, Pennsylvania

Discipline Coordinator, Division of Science (1997–2014)

- Managed and coordinated academic programming across all branch campuses in the sciences, aligning resources, faculty, and academic priorities to enhance interdisciplinary collaboration.
 - **Dean-Equivalent Responsibilities:** Facilitated faculty recruitment, tenure, and promotion decisions; led initiatives for course standardization and research opportunities across Penn State branch campuses.
 - **Committee Leadership:** Chaired the college of science's strategic planning and safety committees; served on faculty evaluation and promotion committees, setting academic standards and promoting faculty excellence.
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Teaching, Mentoring, and Academic Development

- **Student Advising and Mentorship:** Dedicated mentor with a focus on first-year students, offering academic guidance, career counseling, and support for students uncertain of their academic paths.
- **Innovative Pedagogy:** Developed and implemented laboratory experiments emphasizing real-world applications, enhancing student engagement and practical skills in polymer chemistry, materials science, and environmental chemistry.

- **Research Supervision:** Mentored over 80 student research projects in solid-state chemistry, molecular crystals, and organic materials, with many students advancing to prominent graduate programs and industry positions.
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Service and Leadership in Institutional Development

University Service

- **Committee Leadership:**
 - **Promotion Committee:** Played a key role in faculty evaluations, promotions, and academic appointments.
 - **Strategic Planning Committees:** Chaired and contributed to strategic planning initiatives both at Alfaisal and Penn State, shaping long-term academic objectives and resource allocation.
 - **Safety Committee:** Instituted university-wide lab safety protocols, developed safety training for all lab instructors, and supervised safety compliance across facilities.
 - **Eco and Science Club Initiatives:** Founded Alfaisal's Eco and Science Clubs, fostering student interest in environmental issues and scientific exploration, including organizing university-wide sustainability events and outreach.
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Professional Service and Contributions

- **King Faisal Prize Science Selection Committee:** Served as a member, evaluating candidates and advancing excellence in scientific research and scholarship.
- **NSF CAREER Panel:** Participated in the Division of Materials Research panel, reviewing and providing recommendations for NSF CAREER award proposals, a prestigious grant program for junior faculty.
- **Peer Reviewer:** Provided expert reviews for journals such as *Journal of the American Chemical Society*, *Macromolecules*, and *Advanced Functional Materials*, contributing to the advancement of chemical sciences.

Community Engagement

- **Diversity Initiatives:** Served on the Luzerne County Diversity Commission, engaging in workshops, panels, and community outreach to support diversity in education and foster inclusivity.
 - **STEM Outreach:** Conducted science workshops for Girl Scouts, hosted STEM camps for underrepresented students, and mentored high school teams through university-sponsored programs, inspiring the next generation of scientists.
 - **Founder and academic advisor ECO Club, Islamic club and Science Student Association at Alfaisal University**
 - **Volunteer workshops for Faseel**
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Current Research Interests

- **Organic Functional Materials:** Investigating crystal growth for applications in electronics and photonics, specifically targeting organic semiconductors and molecular nanowires.
 - **Polymorphs in Pharmaceuticals:** Focusing on the design of drug polymorphs to enhance stability, solubility, and therapeutic efficacy.
 - **Pedagogical Research:** Innovating chemistry education by integrating research into the undergraduate curriculum, aiming to bridge theory with practical laboratory experiences.
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Select Awards and Honors

- **Outstanding Teaching Faculty Award** – Alfaisal University, 2015
 - **Penn State Faculty Research Award** – 2012
 - **Student Service Award** – Penn State, 2003
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Research Experience and Interests

Research Focus Areas

1. **Development of water-soluble optical & electrochemical biosensors**

2. **Crystal Growth of Organic Functional Materials:** Investigating the crystal growth processes for applications in electronics, photonics, and molecular electronics. This research includes the synthesis of organic semiconductors and the study of charge transport in molecular crystals.
3. **Organic Semiconductors and Molecular Nanowires:** Focused on developing and characterizing new n-type organic semiconductors for solar cells, particularly electron-accepting molecules such as di- and tricyanovinyl-substituted thiophenes.
4. **Drug Polymorphism and Solubility:** Exploring new polymorphs of pharmaceuticals to improve solubility, bioavailability, and thermal stability. Emphasis on solid-state characterization techniques and their applications in drug development.
5. **Pedagogical Research in Chemistry:** Committed to integrating research with teaching by developing experimental modules that bring real-world relevance to undergraduate laboratories.

Select Publications

- **Recent Articles:**
 - *"Alpha-Halogenated Curcumin,"* Pham, P., & Bader, M., under review at ACS Omega, April 2024.
 - *"Di- and Tricyanovinyl-Substituted Triphenylamines: Structural and Computational Studies,"* ACS Omega, 2024.
 - *"Thiophenes Endowed with Electron-Accepting Groups: A Structural Study,"* Cryst. Growth Des., 2024.
 - *"Synthesis and Characterization of a Novel Asymmetric Fused Ladder Oligomer for Applications as Organic Semiconductor,"* MRS Advances, 2023.
- **Book Contributions:** In progress—textbook on organic materials chemistry, focusing on electron-accepting materials and their properties in electronics and photonics.

Patents

- Holds patents on nonlinear optical materials, including Japanese patents for second harmonic-generating devices used in organic photonic applications.

Teaching and Curriculum Development

Teaching Expertise

- **Courses Taught:** Extensive teaching experience across general, organic, polymer, environmental and materials chemistry courses, as well as specialized courses in solid-state chemistry and environmental chemistry.
- **Laboratory Curriculum Development:** Designed research-based laboratory courses in polymer chemistry, materials science, and characterization, emphasizing practical skills such as crystallization, X-ray diffraction, and thermal analysis.
- **Innovative Teaching:** Developed interactive modules to teach complex chemistry concepts using real-world applications, such as using case studies on organic photovoltaics and electronic devices in undergraduate courses.

Mentorship and Student Development

- **Research Supervision:** Supervised 80+ student research projects in molecular crystals, organic electronics, and computational materials chemistry. Many projects involved interdisciplinary research, integrating chemistry with engineering applications.
- **Student-Centered Learning:** Focused on hands-on, inquiry-based learning approaches, which have proven to increase student retention and understanding, particularly for first-year and undecided students.
- **First-Year Student Support:** Mentored first-year students, helping them navigate academic challenges and advising on major selection, particularly within STEM disciplines.

Professional Experience

Alfaisal University, Riyadh, Saudi Arabia

Professor of Chemistry (2013–Present)

- **Curriculum and Program Development:** Developed and implemented advanced courses in materials chemistry, including modules on organic semiconductors and pharmaceutical solubility, designed for both chemistry majors and interdisciplinary students.

- **Interdisciplinary Collaborations:** Established partnerships with engineering and biochemistry departments to support interdisciplinary research projects and co-mentor students.
- **Innovations in Laboratory Instruction:** Pioneered new laboratory protocols and designed modules for undergraduate teaching labs, incorporating current research on organic materials and molecular crystals.

Pennsylvania State University, Hazleton, Pennsylvania

Discipline Coordinator, Division of Science (1997–2014)

- **Faculty Development and Mentorship:** Led initiatives to support early-career faculty, providing mentorship in research design, pedagogical innovation, and student engagement strategies.
- **Laboratory Safety and Training:** Developed comprehensive lab safety protocols and trained faculty on best practices for laboratory instruction and student safety.
- **Community Engagement:** Created outreach programs that brought STEM learning experiences to local high schools and community colleges, fostering interest in science among diverse student populations.

Previous Roles

- **Assistant Professor of Chemistry** – United Arab Emirates University, Al-Ain, UAE (1993–1997)
- **Postdoctoral Research Associate** – University of Minnesota, Department of Chemical Engineering and Materials Science (1992–1993)
- **Visiting Researcher** – Hitachi Research Laboratory, Japan, in the Nonlinear Optics and Liquid Crystals Group (1990–1992)

Professional Affiliations

- **American Chemical Society (ACS)**
- **Materials Research Society**

Honors and Awards

- **Outstanding Teaching Faculty Award** – Alfaisal University, 2015

- **Faculty Research Award** – Penn State, 2012
 - **Student Service Award** – Penn State, 2003
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Service Activities

Institutional Service

- Chaired numerous committees at Alfaisal and Penn State, including **strategic planning, promotion, safety, and curriculum development**.
- Developed faculty guides on teaching best practices in science labs and created faculty booklets on teaching and learning strategies to support new faculty integration and ongoing professional development.

Professional Contributions

- **Editorial and Review Activities:** Reviewer for leading journals, including *Journal of the American Chemical Society*, *Chemistry of Materials*, and *Macromolecules*, contributing expert insights to advance research in organic materials.
- **Advisory Roles:** Served on the G-20 scientific committee on circularity in materials and on the King Faisal Prize Science Selection Committee, assessing international research excellence.

Community Outreach and STEM Advocacy

- **STEM Outreach:** Hosted annual science workshops for Girl Scouts, organized STEM camps for high school students, and participated in Pennsylvania Junior Academy of Sciences as a judge and mentor.
 - **Diversity Advocacy:** Actively engaged with the Luzerne County Diversity Commission to support inclusive education and promote diversity in STEM fields.
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Conferences and Invited Talks

- Recent invited speaker engagements include the **American Chemical Society National Spring Meeting** (2024), **MRS Spring Meeting** (2023), and the **IIUM Biotechnology Conference** (2016).

- Presented research findings at over 60 conferences, with a focus on organic semiconductor materials, drug polymorphism, and applications of electron-accepting oligothiophenes.

PUBLICATIONS:

1. Bader, M. M. Optical and Single Crystal Structural Studies. *CrystEngComm*, 2025, *In Press*. Invited Highlights Article.
2. Bromocurcumin: Optical and Structural Chemistry, under review, Dec. 11, 2024.
3. Chlorocurcumin: Optical and Structural Chemistry, under review, Dec. 4, 2024.
4. Bader, M. M.; Pham, P.-T. T.; Abu Khodair, S. S.; Saleh, M. I. Benzo[a][1,4]benzothiazino[3,2-c]phenothiazine. *IUCrData* **2024**, 9 (4), x240357. DOI: [10.1107/S2414314624003572](https://doi.org/10.1107/S2414314624003572).
5. Bader, M. M.; Fiester, C.; Pham, P.-T. T.; Bradley, A.; Nazzal, A. 13-Nitrobenzo[a][1,4]benzothiazino[3,2-c]phenoxazine. *IUCrData* **2024**, 9 (4), x240299. DOI: [10.1107/S2414314624002992](https://doi.org/10.1107/S2414314624002992).
6. Bader, M. M.; Pham, P.-T. Crystal Structure of 1-{4-[Bis(4-methylphenyl)amino]phenyl}ethene-1,2,2-tricarbonitrile. *Acta Crystallogr., Sect. E: Crystallogr. Commun.* **2024**, 80 (3), 339–342. DOI: [10.1107/S2056989024001804](https://doi.org/10.1107/S2056989024001804).
7. Pham, P.-T. T.; Bader, M. M. Design of Novel Functional Materials Using Reactions of Quinones with Aromatic Amines. *In Novelities in Schiff Bases*; Akitsu, T., Ed.; IntechOpen: Rijeka, 2024; Chapter 3. DOI: [10.5772/intechopen.114301](https://doi.org/10.5772/intechopen.114301).
8. Pham, P.-T. T.; Bader, M. M. α -Halogenated Curcumins. *Crystals* **2024**, 14 (12), 1041. DOI: [10.3390/cryst14121041](https://doi.org/10.3390/cryst14121041).
9. Bader, M. M.; Pham, P.-T. T. Benzo[a]benzo[5,6][1,4]thiazino[3,2-c]phenothiazine. *IUCrData*, Accepted Apr. 15, 2024, *In Press*.
10. Bader, M. M.; Fiester, C.; Pham, P.-T. T.; Bradley, A.; Nazzal, A. *IUCrData* **2024**, 9 (Accepted Apr. 7, 2024), DOI: [10.1107/S2414314624002992](https://doi.org/10.1107/S2414314624002992).
11. Pham, P.-T.; Bader, M. M. Di- and Tricyanovinyl-Substituted Triphenylamines: Structural and Computational Studies. *ACS Omega* **2024**, *In Press*. DOI: [10.1021/acsomega.3c05312](https://doi.org/10.1021/acsomega.3c05312).

12. Pham, P.-T.; Bader, M. M. Thiophenes Endowed with Electron-Accepting Groups: A Structural Study. *Cryst. Growth Des.* **2024**, *24*, 906–912.
13. Bader, M. M.; Pham, P.-T. Crystal Structure of 1-{4-[Bis(4-methylphenyl)amino]phenyl}ethene-1,2,2-tricarbonitrile. *Acta Crystallogr., Sect. E* **2024**, *80* (3), 339–342.
14. Pham, P.-T.; Bader, M. M. Design of Novel Functional Materials Using Reactions of Quinones with Aromatic Amines. *In Novelities in Schiff Bases*; Akitsu, T., Ed.; IntechOpen: Rijeka, Accepted Feb. 2024. DOI: [10.5772/intechopen.114301](https://doi.org/10.5772/intechopen.114301).
15. Fiester, C.; Pham, P.-T. T.; Bradley, A.; Nazzal, A.; Bader, M. M. Synthesis and Characterization of a Novel Asymmetric Fused Ladder Oligomer for Applications as Organic Semiconductor. *MRS Adv.* **2023**, *8*, 889–893. DOI: [10.1557/s43580-023-00609-y](https://doi.org/10.1557/s43580-023-00609-y).
16. Pham, P.-T. T.; Bader, M. M. NC-Ph-T-Ph-CN; CCDC 2270158: Experimental Crystal Structure Determination. 2023. DOI: [10.5517/ccdc.csd.cc2g68xw](https://doi.org/10.5517/ccdc.csd.cc2g68xw).
17. Pham, P.-T. T.; Bader, M. M. (DCV)₂-22-2T; CCDC 2289032: Experimental Crystal Structure Determination. 2023. DOI: [10.5517/ccdc.csd.cc2gtxrz](https://doi.org/10.5517/ccdc.csd.cc2gtxrz).
18. Pham, P.-T. T.; Bader, M. M. 5,5'-Dinitro-2,2'-Bithiophene; CCDC 2270317: Experimental Crystal Structure Determination. 2023. DOI: [10.5517/ccdc.csd.cc2g6g16](https://doi.org/10.5517/ccdc.csd.cc2g6g16).
19. Pham, P.-T. T.; Bader, M. M. [35-(4-Methylphenyl)[12,22:25,32-Terthiophen]-15-yl]Ethene-1,1,2-Tricarbonitrile; CCDC 2270159: Experimental Crystal Structure Determination. 2023. DOI: [10.5517/ccdc.csd.cc2g68yx](https://doi.org/10.5517/ccdc.csd.cc2g68yx).
20. Pham, P.-T. T.; Bader, M. M. 4-Bromo-N,N-Diphenylaniline; CCDC 2202336: Experimental Crystal Structure Determination. 2022. DOI: [10.5517/ccdc.csd.cc2cxq34](https://doi.org/10.5517/ccdc.csd.cc2cxq34).
21. Pham, P.-T. T.; Bader, M. M. CCDC 2208325: Experimental Crystal Structure Determination. 2022. DOI: [10.5517/ccdc.csd.cc2d3y9s](https://doi.org/10.5517/ccdc.csd.cc2d3y9s).
22. Bader, M. M.; Pham, P.-T. T. CCDC 2208326: Experimental Crystal Structure Determination. 2022. DOI: [10.5517/ccdc.csd.cc2d3ybt](https://doi.org/10.5517/ccdc.csd.cc2d3ybt).
23. Pham, P.-T. T.; Bader, M. M. [(Thieno[3,2-b]Thiophen-2-yl)Methylidene]Propanedinitrile; CCDC 2208322: Experimental Crystal Structure Determination. 2022. DOI: [10.5517/ccdc.csd.cc2d3y6p](https://doi.org/10.5517/ccdc.csd.cc2d3y6p).

24. Pham, P.-T. T.; Bader, M. M. [(2,2'-Bithiophen)-5-yl]Methylidene]Propanedinitrile; CCDC 2208323: Experimental Crystal Structure Determination. 2022. DOI: 10.5517/ccdc.csd.cc2d3y7q.
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