

Sahar Bayat

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● EDUCATION AND TRAINING

22/08/2022 – CURRENT Lexington, United States

PHD MATERIALS CHEMISTRY, SUPERVISOR: PROF. CHAD RISKO University of Kentucky

20/09/2018 – 12/11/2020 Tehran, Iran

MS CATALYSIS CHEMISTRY, SUPERVISOR: PROF. S.SHAHAB NAGHAVI Shahid Beheshti University

Final grade Excellent | **Thesis** Silver chalcogenides 2DCs application in photocatalytic water splitting based on DFT

19/09/2010 – 28/01/2015 Tehran, Iran

BS APPLIED CHEMISTRY Shahid Beheshti University

● PROJECTS

01/05/2023 – CURRENT

Evaluation of structural properties in amorphous Mo₃S₁₃ chalcogel-based electrodes for Li/Na ion batteries through ab initio molecular dynamics in VASP

Applying AIMD-MQ simulations, this project aims to evaluate bond lengths in amorphous Mo₃S₁₃. By analyzing the pair correlation function (PCF) $g(r)$, insights into local atomic arrangements and bonding environments are sought, aiding in understanding Mo-Mo, Mo-S, and S-S distances.

University of Kentucky, Dr. Chad Risko

01/02/2024 – CURRENT

Simulating x-ray absorption spectroscopy (XAS) K- & L-edges of (NH₄)₂Mo₃S₁₃ in VASP

This project aims to calculate X-ray absorption spectroscopy (XAS) K- & L-edges in (NH₄)₂Mo₃S₁₃ using the supercell core-hole (SCH) method. By examining XAS spectra, insights into local structure and bonding properties of molybdenum and sulfur coordination are anticipated.

University of Kentucky, Dr. Chad Risko

19/08/2018 – 11/11/2020

DFT study of 2D silver chalcogenide and their application in photocatalytic water splitting

Shahid Beheshti University, Dr. Shahab Naghavi

20/07/2018 – 20/07/2022

Synthesis and characterization of high performance polycarboxylate superplasticizer (PCE) for application in concrete admixtures

Abadgaran Construction Chemical Manufacturer, R&D Dept.

● PATENT

20/01/2022

Modified carboxylate/vinyl ester copolymers for concrete admixtures

Publication : **WO2022013600A1**, A-2022-01-20, Application : **IB2020056651WA**·2020-07-15

T. Salemnoush, **S.Bayat**, A. M. Hosseini

● PUBLICATIONS

2024

Mo₃S₁₃ Chalcogel: A High-Capacity Electrode for Conversion-Based Li-ion Batteries

Islam, T.; Roy, S. C.; **Bayat, S.**; Weret, M. A.; Hoffman, J. M.; Rao, K. R.; Sawicki, C.; Nie, J.; Alam, R.; Oketola, O. Mo3S13 Chalcogel: A High-Capacity Electrode for Conversion-Based Li-ion Batteries. *ChemSusChem* **2024**, e202400084.

2023

Chalco-carbogels as High-Capacity and Cycle-Stable Electrode Materials for Lithium and Sodium Ion Batteries

Islam, T.; Li, M.; Blanton, A.; Pitton, K. A.; Rao, K. R.; **Bayat, S.**; Wiaderek, K. M.; Weret, M. A.; Roy, S. C.; Feng, R. Chalco-carbogels as High-Capacity and Cycle-Stable Electrode Materials for Lithium and Sodium Ion Batteries. *ACS Energy Letters* **2023**, 9 (1), 1-9.

2020

Ethyl ester of vegetable oil derived carboxy-imidazoline drilling corrosion inhibitor

National Intellectual Property Center of the Islamic Republic of Iran

2021

Efficient method for synthesizing 4,4'-Methylenedianiline by reduction of aromatic nitro compounds

National Intellectual Property Center of the Islamic Republic of Iran

2020

Superplasticizer admixture of amphoteric copolymers of styrene and maleic anhydride with superior water reduction ability

National Intellectual Property Center of the Islamic Republic of Iran

● **CONFERENCES AND SEMINARS**

04/2024 Materials Research Society, Seattle, Wa., Spring 2024

Structural Properties and Ion Diffusion Pathways in Molybdenum Sulfide Materials of Interest for Li-S Batteries

Sahar Bayat, Keerthan R. Rao, Taohedul Islam, Saiful M. Islam, and Chad Risko (*Poster Presentation*)

28/03/2024 Lexington, Ky

49th Annual Naff Symposium, Poster presentation: Structural properties in amorphous molybdenum sulfide materials of interest for Li-S batteries

Sahar Bayat, Keerthan R. Rao, Taohedul Islam, Saiful M. Islam, and Chad Risko (*Poster Presentation*)

03/2024 ACS Spring 2024

Chalco-carbogels as high capacity and cycle-stable electrode materials for lithium- and sodium-ion batteries

T. Islam, M. Li, A. Blanton, K. Pitton, K. Rao, **S. Bayat**, K. Wiaderek, M. Weret, S. Roy, R. Feng, D. Li, R. Alam, J. Nie, O. Oketola, A. Pramanik, B. Guiton, C. Risko, I. Belharouak, R. Amin, S. Islam

10/2024 The Electrochemical Society PRiME 2024

Chalcogenide-Based Gels As High-Capacity Electrodes for Lithium-Ion Batteries

S. M. Islam, I. Taohedul, M. Weret, S. Roy, **S. Bayat**, K. Rao, M. Li, C. M. Risko, K. Wiaderek, and R. Amin (*Oral Presentation*)

09/01/2019 Shahid Beheshti University

5th national conference on presentation of " A Review of Redox and Thermal Initiation in Free Radical Polymerization"

09/01/2019 Shahid Beheshti University

5th national conference on presentation of " A review of industrial heterogeneous catalysis esterification"

19/02/2018 Amirkabir University of Technology

5th international conference on presentation of " Evaluation of water based, non-corrosive and eco-friendly form release agent"

● HONOURS AND AWARDS

26/04/2024

Fast Start Award – University of Kentucky

28/03/2024

Naff Symposium 2nd Place Poster Presentation – University of Kentucky

15/02/2022

Mark and Ruth Luckens Graduate Fellowship – University of Kentucky

● WORK EXPERIENCE

12/05/2023 – CURRENT Lexington, United States

UNIVERSITY RESEARCH ASSISTANT UNIVERSITY OF KENTUCKY

- Reviewing published literature, designing, and conducting simulations
- Analyzing and summarizing results, preparing reports
- Attending regular project progress and discussion meetings

20/08/2022 – 20/12/2023 Lexington, United States

UNIVERSITY TEACHING ASSISTANT UNIVERSITY OF KENTUCKY

- Instruct students organic chemistry laboratory (CHE 233) course
- Adhering to departmental approved course outlines and syllabi, using approved text and other instructional materials
- Meeting with supervisor and other TAs on a regular basis
- Grading class materials
- Meeting and assisting individual students during office hours

29/06/2017 – 20/07/2022 Tehran, Iran

RESEARCH CHEMIST ABADGARAN CHEMICAL TECHNOLOGY DEVELOPMENT RESEARCH GROUP

1. *Research project on energy engineering in construction by means of synthesizing Superplasticizers/Water reducer additives for concrete*
2. *Research project on synthesis of vegetable oil based curing agents for application in adhesives, coatings, sealants, filler, floor and flooring repair, encapsulation*
3. *Research project on synthesis of heterocyclic imidazoline compounds for application in drilling corrosion inhibitors*
4. *Research project on synthesis of isothiazolinone as an antimicrobials and preservatives*

Including tasks:

- Synthesizing compounds and developing analytical and chemical test methods for characterization.
- Recording and analyzing data based on researches and studies.
- Researching and writing papers, patents, reports and reviews.
- Participating in conferences, presenting and related exhibitions.
- Supervising junior staff, including junior researchers, and laboratory technicians.

Business or Sector Manufacturing | **Department** Research and Development |

Email s.bayat@abadgarangroup.com

21/09/2015 – 30/06/2017 Tehran, Iran

RESEARCH CHEMIST CHITO TECH COMPANY

Conducting research project on wound dressing and hemostatic based on silver nanoparticles

Including tasks:

- Designing new wound dressings based on colloidal silver technology as an effective antiseptic agent.
- Fabricating chitosan and chitin based hybrid materials for treatments of chronic or/and acute burn wounds.

- Collecting and analysis of project required technical specification in accordance with Iranian Ministry of Health as well as CE, ISO13485 standards.
- Designing and conducting tests and experiments for analyzing syntheses products as well as raw materials.
- Designing new formulation for hygiene products by compounding various natural biopolymers.
- Conducting compound analysis by applying spectrophotometry methods and determining the physical and chemical properties.
- Making sure that all GMPs, regulatory mandates and quality requirements are correctly met.

Business or Sector Manufacturing | **Department** Research and Development

● **DIGITAL SKILLS**

First-Principles Simulation: VASP, Quantum Espresso | Programming languages (Python and R program)

● **LANGUAGE SKILLS**

Mother tongue(s): **PERSIAN**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	C1	C1	C1	C1	B2
FRENCH	B2	B1	B1	B2	B1
SPANISH	B1	A2	A2	B1	A1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user