

Elham Asadian, PhD of Nanoscience & Nanotechnology

Assistant Professor

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Research Interests

Biosensors, Drug Delivery, Theranostics, 2D materials, Bioelectrochemistry

Education

Postdoc. 2016-2019	Sharif University of Technology Institute for Nanoscience and Nanotechnology (INST) Project: “Metal-organic frameworks (MOFs) and their applications in electrochemical sensors design and fabrication” Three years postdoctoral fellowship awarded by Iran Nanotechnology Initiative Council (INIC)	<i>Tehran, Iran</i>
PhD 2010-2016	Sharif University of Technology Institute for Nanoscience and Nanotechnology (INST) Thesis Title: “Synthesis of hybrid graphene nanostructures and their application in design and fabrication of electrochemical sensors for pharmaceutical and biological applications” Thesis Degree: Excellent Supervisors: Prof. Shahrokhian, Prof. Iraj Zad Co-supervisor: Prof. Mohajerzadeh Graduated with Honors: 1 st rank among PhD candidates (GPA 19/20)	<i>Tehran, Iran</i>
Sabbatical 2014-2015	Visiting scholar at Nanyang Technological University (NTU) School of Material Science and Engineering (MSE) Project: “Design and fabrication of 3D graphene networks (3DGNs)/metal oxide composites for sensing applications” Supervisor: Prof. Hua Zhang	<i>Singapore</i>
M.SC 2007-2009	Sharif University of Technology Chemistry Department, Analytical Chemistry Thesis: “Chemically modified electrodes based on conducting polymers and carbon nanotubes in clinical and pharmaceutical applications” Supervisor: Prof. Shahrokhian Thesis note: 19.90/20	<i>Tehran, Iran</i>
B.SC 2002-2006	Kharazmi University (Teacher Training University) Chemistry Department, Pure Chemistry	<i>Tehran, Iran</i>

Honors & Awards

- Winner of Kazemi Ashtiani Award from the National Elite Foundation, 2019
- Selected in a World-wide Competition as a Young Scientist for Participation in Lindau Nobel Laureate Meeting 2017, 24-30 June, Lindau Germany (The only representer from Iran)
- Winner of Baden-Wurttemberg Program of the Lindau Nobel Laureate Meeting 2017, 1-7 July, Baden-Wurttemberg State, Germany (5000 Euro)
- Three years postdoctoral scholarship from Iranian Nanotechnology Initiative Council
- 1st rank in the PhD entrance exam and first ranked PhD graduated student from INST
- 2nd rank in master national entrance exam among 11000 participants, 2007

Journal Papers

- M., Vafaiee, R., Mohammadpour, M., Vossoughi, **E., Asadian**, M., Janahmadi, P. Sasanpour, "Carbon Nanotube Modified Microelectrode Array for Neural Interface". *Frontiers in Bioengineering and Biotechnology* (2021) 8, 1465.
- A. Naseri, M. R. Hormozi-Nezhad, S. Shahrokhian, **E. Asadian**, "Silver nanowires immobilized on gold-modified glassy carbon electrode for electrochemical quantification of atorvastatin". *Journal of Electroanalytical Chemistry* (2020) 876, 114540.
- H. Ahmadvand, R. Mohammadpour, S. H. Hosseini-Shokouh, E. Asadian, "Room temperature and high response ethanol sensor based on two-dimensional hybrid nanostructures of WS₂/GONRs", *Scientific Reports* (2020) 10 (1), 1-9.
- F. Ejehi, R. Mohammadpour, **E. Asadian**, P. Sasanpour, S. Fardindoost, O. Akhavan, "Graphene Oxide Papers in Nanogenerators for Self-Powered Humidity Sensing by Finger Tapping", *Scientific reports* 10 (2020) 1-11.
- Z. Hosseindokht, R. Mohammadpour, **E. Asadian**, M. Paryavi, H. Rafii-Tabar, P. Sasanpour, "Low-cost flexible pressure sensor using laser scribed GO/RGO periodic structure for electronic skin applications", *Superlattices and Microstructures* (2020) 106470.
- **E. Asadian**, S. Shahrokhian, A. Iarji Zad, "ZIF-8/PEDOT@ flexible carbon cloth electrode as highly efficient electrocatalyst for oxygen reduction reaction", *International Journal of Hydrogen Energy* 45 (2020) 1890-1900.
- **E. Asadian**, M. Ghalkhani, S. Shahrokhian, "Electrochemical Sensing Based on Carbon Nanoparticles: A Review", *Sensors and Actuators B: Chemical* 293 (2019) 183-209.
- R. Khoramian, SA. Ramazani, M. Hekmatzadeh, R. Kharrat, **E. Asadian**, "Graphene Oxide Nanosheets for Oil Recovery", *ACS Applied Nano Materials* 2 (2019) 5730-5742.
- Kheirabadi, M., Samadi, M., **Asadian**, E., Zhou, Y., Dong, C., Zhang, J., Moshfegh, A. Z, "Well-designed Ag/ZnO/3D Graphene Structure for Dye Removal: Adsorption, Photocatalysis and Physical Separation Capabilities", *Journal of Colloid and Interface Science* 537 (2019) 66-78.
- E. Jokar, S. Shahrokhian, **E. Asadian**, H. Hosseini, "An Efficient Two-step Approach for Improvement of Graphene Aerogel Characteristics in Preparation of Supercapacitor Electrodes" *Journal of Energy Storage* 17 (2018) 465-473.
- **E. Asadian**, S. Shahrokhian, A. Irajzi Zad, "Highly Sensitive Nonenzymetic Glucose Sensing Platform based on MOF-derived NiCo LDH Nanosheets/Graphene Nanoribbons Composite", *Journal of Electroanalytical Chemistry* 808 (2018) 114-123.
- Z. Hosseindokht, M. Paryavi, **E. Asadian**, R. Mohammadpour, H. Rafii-Tabar, P. Sasanpour, "Pressure Sensor Based on Patterned Laser Scribed Reduced Graphene Oxide; Experiment & Modeling", *IEEE*, (2017) International Conference on Orange Technologies (ICOT) (pp. 15-17)
- **E. Asadian**, S. Shahrokhian, A. Irajzi zad, F. Ghorbani-Bidkorbeh, "Glassy Carbon Electrode Modified with 3D Graphene/CNT Network for Sensitive Electrochemical Determination of Methotrexate", *Sensors and Actuators B: Chemical* 239 (2017) 617-627 (**Top cited & Hot article**).
- **E. Asadian**, A. Irajzi zad, S. Shahrokhian, "Voltammetric Studies of Azathioprine on the Surface of Graphite Electrode Modified with Graphene Nanosheets Decorated with Ag Nanoparticles", *Materials Science and Engineering: C* 58 (2016) 1098-1104.
- **E. Asadian**, S. Shahrokhian, A. Irajzi zad, "Hierarchical Core-shell Structure of ZnO Nanotube/MnO₂ Nanosheet Arrays on 3D Graphene Network as a High-Performance Biosensing Platform", *RSC Advances* 6 (2016) 61190-61199.
- R. Mohammadi, S. Shahrokhian, **E. Asadian**, "One-step Fabrication of Electrochemically Reduced Graphene Oxide/Nickel Oxide Composite for Binder-free Supercapacitors", *International Journal of Hydrogen Energy* 41 (2016) 17496-17505.
- M. Kheirabadi, R. Bagheri, K. Kabiri, D. A. Ossipov, E. Jokar, **E. Asadian**, "Improvement in Mechanical Performance of Anionic Hydrogels Using Full-Interpenetrating Polymer Network Reinforced with Graphene Oxide Nanosheets" *Advances in Polymer Technology* 35(2016) 386-395.
- **E. Asadian**, S. Shahrokhian, A. Irajzi zad, E. Jokar, "In-situ Electro-polymerization of Graphene Nanoribbon/Polyaniline Composite Film: Application to Sensitive Electrochemical Detection of Dobutamine", *Sensors and Actuators B: Chemical* 196 (2014) 582-588.
- S. Shahrokhian, **E. Asadian**, "Simultaneous Voltammetric Determination of Ascorbic acid, Acetaminophen and Isoniazid using Thionine Immobilized Multi-Walled Carbon Nanotube Modified Carbon Paste Electrode", *Electrochimica Acta* 55 (2010) 666-672 (**Top Cited Paper**)
- S. Shahrokhian, **E. Asadian**, "Electrochemical Determination of L-dopa in the Presence of Ascorbic Acid on the Surface of the Glassy Carbon Electrode Modified by a Bilayer of Multi-walled Carbon Nanotube and Polypyrrole Doped with Tiron", *Journal of Electroanalytical Chemistry* 636 (2009) 40-46.

Conferences

- E. Asadian, "Graphene and Graphene-based Materials and their Application in Fabrication of Electrochemical Sensors for Pharmaceutical and Biological Determinations", *INN international Conference in Nanotechnology and Nanomedicine*, **2017**, Materials and Energy Research Center (MERC), Alborz, **Iran** (Invited speaker)
- E. Asadian, S Shahrokhian, A. Irajizad, "Glassy Carbon Electrode Modified with CNT Doped 3D Graphene Network: Application to the Highly Sensitive Electrochemical Determination of Methotrexate", *6th International Conference on Nanostructures (ICNS6)*, **2016**, Kish Island, **Iran** (Oral presentation)
- E. Asadian, S Shahrokhian, A. Irajizad, "Hierarchical Structure of ZnO Nanotubes@MnO₂ Nanosheets on 3D Graphene Network as a Sensing Platform", *6th International Conference on Advanced Nanomaterials (ANM2015)*, **2015**, Aveiro, **Portugal** (Oral presentation, Session Chair)
- E. Asadian, S. Shahrokhian, A. Irajizad, "Graphene Nanosheets Decorated with Ag Nanoparticles: Application to the Highly Sensitive Electrochemical Determination of Azathioprine Drug", *Seminar on Sensor Science and Technology (SSST2015)*, **2015**, Sharif University of Technology, Tehran, **Iran** (Poster presentation)
- E. Asadian, S. Shahrokhian, A. Irajizad, "In-situ Electropolymerized Graphene Nanoribbon/Polyaniline Composite Film for Sensing Applications", *5th International Conference in Nanostructures (ICNS5)*, **2014**, Kish Island, **Iran** (Poster presentation)
- E. Asadian, S. Shahrokhian, "Simultaneous Voltammetric Determination of Ascorbic acid, Acetaminophen and Isoniazid Using Thionine Immobilized Multi-walled Carbon Nanotube Modified Carbon Paste Electrode", *International Congress of Young Chemists 'YoungChem2011'*, **2011**, Cracow, **Poland** (Poster presentation)
- E. Asadian, S. Shahrokhian, "Electrochemical Determination of L-dopa on the Surface of the Glassy Carbon Electrode Modified by a Bilayer of MWCNT and Polypyrrole Doped with Tiron", *60th Annual Meeting of the International Society of Electrochemistry (ISE)*, **2009**, Beijing, **China** (Oral presentation)

Workshops

- 3rd PAM International School on Applications of Nanomaterials in Medicine, 2-4 November **2016**, Sharif University of Technology, Tehran, Iran.
- 2nd PAM International School on Emergent Quantum Phenomena in Graphene, **2015**, Department of Physics, Sharif University of Technology, Tehran, Iran (with participation of Prof. Dr. K. Novoselov)
- "Nanocrystal Growth and Characterization", By Prof. Luis M. Liz-Marzán (Ikerbasque Research Professor, Scientific Director of CIC biomaGUNE), *6th International Conference on Nanostructures (ICNS6)*, **2016**, Kish Island, Iran
- "Non-Traditional Synthetic Methods", By Prof. Kenneth S. Suslick (Professor of Chemistry, Professor of Materials Science & Engineering, - University of Illinois at Urbana-Champaign), *6th International Conference on Nanostructures (ICNS6)*, **2016**, Kish Island, Iran.
- "Advances in Electrospinning", By Prof. Seeram Ramakrishna (National University of Singapore), *4th International Conference in Nanostructures (ICNS4)*, **2012**, Kish Island, Iran

Teaching Experiences

Shahid Beheshti University of Medical Sciences (SBMU)

- Synthesis of nanomaterials **From 2019**
- Nanobiotechnology/Advanced Nanomedicine
- Drug delivery systems

Sharif University of Technology

- Institute for Nanoscience and Nanotechnology (INST) **2016-2019**
Nanoscience Laboratory for PhD students
- Analytical Chemistry, Chemical Engineering Department (Undergraduate) **2018-2019**

Chemistry Department (Undergraduate)

- Analytical Chemistry
- Electrochemistry
- English for Chemistry Students

Academic Activities

- Cooperating with ONS group (Optic, Nano, Surface) in surface physics and thin film labs, Physics department, Sharif University of Technology, 2014-2019
- Executive member of the organizing committee of 4th International Conference on Nanostructures (ICNS4), 12-14 March 2012, Kish Island, Iran
- Executive member of the organizing committee of 6th International Conference on Nanostructures (ICNS6), 7-10 March 2016, Kish Island, Iran
- Member of organizing committee of 3rd PAM International School (Applications of Nanomaterials in medicine), 2-4 November 2016, Sharif University of Technology, Tehran, Iran
- Executive member of the scientific committee of 7th International Conference on Nanostructures (ICNS7), 27 Feb. -1 March 2018, Iran
- Executive member of the scientific committee of 8th International Conference on Nanostructures (ICNS8), 18-20 November 2020, Iran

Skills & Expertise

Language Skills

- Persian: Mother language
- English: Fluent (TOEFL score 100/120)
- French: Fluent (Le niveau C1)

Experimental Skills

Chemical Synthetic Protocols

- Over 12 years' experience working in synthesis Lab on various nanomaterials such as carbon nanostructures (CNT, Graphene, Graphene Nanoribbons, 3D graphene hydrogels), Hydrothermal synthesis of nanomaterials, Metal oxides, SPIONs (Fe₃O₄), Metal-organic Frameworks (MOFs)

Cell Culture

Electrochemical Analysis Technique

- Including CV, DPV, LSV, SWV, Amperometry and EIS
- 8 years of experience working with various electrochemical workstations including Autolab, Metrohm (797 & 757), CH Instrument and IVIUM Potentiostat
- Electrochemical polymerization and deposition
- Familiar with NOVA, GPES, FRA and electrochemical data processing software

Thin Film Deposition Systems

- E-beam evaporation, chemical evaporation (CVD), Plasma-enhanced chemical vapor deposition (PECVD)

Thin Films and Materials Characterization Methods

- AFM, XRD, PL & UV-Vis spectroscopy, HPLC

IT Skills

- Operating systems: Windows XP/7/10
- Office: Word, Excel, PowerPoint
- Familiar with Photoshop and Illustrator

References

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