Elif Demir Arabacı

Yenimahalle/ANKARA
+90537 991-93-00
elifdemirarabaci@gmail.com
linkedin.com/in/elif-demir-arabaci

About

I completed my Ph.D. in Chemistry at Middle East Technical University (METU) in July 2024 and am currently a research assistant at METU. My research expertise includes organic and inorganic synthesis, electrochemical studies, water splitting, and theoretical chemistry. I have extensively studied the electrochemical and optical properties of conjugated small molecules and polymers, as well as the electrocatalytic properties of nano-catalysts using advanced electroanalytical and spectroscopic methods.

Education

PhD | Middle East Technical University | Chemistry

2017 –2024

3.50/4.00; GPA

My doctoral research focused on the synthesis and characterization of donor-acceptor type monomers and polymers to investigate the structural alteration on the backbone and side chain of conjugated systems. I thoroughly investigated the electrochemical and optical properties of conjugated small molecules and polymers using electroanalytical and spectroscopic methods. DFT calculations were employed to support the experimental results.

M.Sc.| Middle East Technical University | Chemistry

2015 – 2017

3.50/4.00; GPA

My M.Sc. research focused on designing, synthesizing, and characterizing catalysts used for hydrogen and oxygen evolution in water splitting. Also, the detailed electrochemical studies were conducted to determine the efficiencies of these catalysts in the field of sustainable energy.

B.Sc. | Middle East Technical University | Chemistry

2010 – 2015

2.88/4.00; GPA

Experience

Research and Teaching Assistant | Middle East Technical University

05.2018 – Current

As a lab coordinator, significantly contributed to the maintenance and organization of laboratory equipment, hence assuring efficient day-to-day operations.

Created or enhanced experimental protocols, resulting in improved efficiency and precision in data acquisition.

Worked closely with principle investigators and colleagues to develop experimental designs and conduct data analysis.

Scientific works have undergone thorough evaluation by experts and have been published in reputable journals that have a substantial impact on the field. Contributed to the process of preparing, submitting, and revising manuscripts.

Research and Teaching Assistant | Atılım University

05.2016 – 02.2018

Offered mentorship to undergraduate and graduate students in laboratory protocols and research strategies.

Implemented innovative methodologies for problem-solving that significantly enhanced the overall research productivity.

Exhibited exceptional project management abilities by effectively organizing various research tasks and successfully adhering to strict time constraints.

Project Support Member | Arçelik - Dishwasher Factory

10.2015 – 03.2016

As a project supporter on a team developing a new dishwasher item, I scrutinized the methods and outcomes of this innovative approach.

Skills

- **Electrochemical Techniques:** Linear Sweep Voltammetry (LSV), Cyclic Voltammetry (CV), Electrochemical Impedance Spectroscopy (EIS), Differential Pulse Voltammetry (DPV), Square Wave Voltammetry (SWV), Constant Current Electrolysis, Constant Potential Electrolysis.
- **Characterization Techniques:** Transmission Electron Microscopy (TEM), X-Ray Diffraction (XRD), X-Ray Photoelectron Spectroscopy (XPS), Fourier Transform Infrared Spectroscopy (FTIR), UV-Visible Spectroscopy, Fluorescence Spectroscopy, Nuclear Magnetic Resonance (NMR).
- **Computer Programs:** Office programs, Chemdraw, Origin, MestReNova, Gaussian09.

Research Articles

- E. Demir, S. Akbayrak, A.M. Önal, S. Özkar, Nanoceria-Supported Ruthenium(0) Nanoparticles:Highly Active and Stable Catalysts for Hydrogen Evolution from Water, ACS Applied Materials & Interfaces, 10 (2018) 6299-6308. doi:10.1021/acsami.7b17469
- E. Demir, S. Akbayrak, A.M. Önal, S. Özkar, Titania, zirconia and hafnia supported ruthenium(0) nanoparticles: Highly active hydrogen evolution catalysts, Journal of Colloid and Interface Science, 531 (2018) 570-577. doi: 10.1016/j.jcis.2018.07.085
- E. Demir, S. Akbayrak, A.M. Önal, S. Özkar, Ceria supported ruthenium(0) nanoparticles: Highlyefficient catalysts in oxygen evolution reaction, Journal of Colloid and Interface Science, 534 (2019) 704-710.doi: 10.1016/j.jcis.2018.09.075
- E. Demir Arabacı, A.M. Önal, S. Özkar, Ceria Supported Nickel(0) Nanoparticles: A Highly Activeand Low-Cost Electrocatalyst for Hydrogen Evolution Reaction, Journal of The Electrochemical Society, 167 (2020) 106513. doi: 10.1149/1945-7111/ab9d9
- D. Çakal, E. Demir Arabacı, E. Yildirim, A. Cihaner, A.M. Önal, Side chain effect on the electrochemical and optical properties of thieno[3,4-*c*]pyrrole-4,6-dione based donor–acceptor donor type monomers and polymers, Molecular System Design & Engineering, 8 (2023) 65-78. doi: 10.1039/D2ME00148A
- E. Demir Arabacı, E. Yildirim, A.M. Önal, Theoretical and experimental investigation of bridgingatom effect on the fluorene and silafluorene based trimeric monomers and their corresponding polymers, Dyes and Pigments, 216 (2023) 111320. Doi: 10.1016/j.dyepig.2023.111320
- D. Çakal, E. Demir Arabacı, E. Yildirim, A. Cihaner, A.M. Önal, Effect of phthalimide and thieno[3,4-c]pyrrole-4,6,dione acceptors on π-conjugated donor-acceptor-donor monomers: experimental and theoretical investigations of photophysical and electrochemical properties, Tetrahedron, 140 (2023) 133473. doi: 10.1016/j.tet.2023.133473
- E. Demir Arabacı, D. Çakal, The effect of branched versus linear side chain on thieno[3,4-*c*]pyrrole-4,6-dione-based donor-acceptor-donor type monomers and their p- and n-dopable polymers, Polymer, 282 (2023)126159. doi: 10.1016/j.polymer.2023.126159

- E. Demir Arabacı, O. Karakurt, A. Cirpan, E. Yildirim, A.M. Önal, The impact of π-bridge moiety on the optoelectronic properties and photochemical stabilities of benzodithiophene-based conjugated polymers, Polymer, 313 (2024)127736. https://doi.org/10.1016/j.polymer.2024.127736

Congress

- E. Demir, S. Akbayrak, A.M. Önal, S. Özkar, Camsı Karbon Elektrotlar Yüzeyine Tutturulmuş Ru^0/MO_2 (M = Ti, Zr, Hf, Ce) Nanokümelerinin Sudan Hidrojen ve Oksijen Salımı için çiftişlevli Elektrokatalizör Olarak Geliştirilmesi, 29. National Chemistry Congress, Ankara; 10.09.2017-14.09.2017.
- E. Demir, S. Akbayrak, A.M. Önal, S. Özkar, Nanoceria-Supported Ruthenium(0) Nanoparticles: Highly Active and Stable Catalysts for Hydrogen Evolution from Water, 69th Annual Meeting of the International Society ofElectrochemistry, Bologna; 02.09.2018-07.09.2018.
- E. Demir Arabacı, O. Karakurt, A. Cirpan, E. Yildirim, A.M. Önal, The Impact of π-bridge Moieties on the Photodegradation of D-π-A Type Conjugated Polymers Based on Benzooxadiazole and Benzodithiophene, IX. International Polymer Science and Technology Congress, Ankara; 16.09.2024-18.09.2024.

References

- Available upon request.