Raul A. Marquez-Montes

As of July 21, 2025
Phone: +1(737) 382-0592 | Email: raul.marquez@utexas.edu | ORCID | Academic Website

EDUCATION

The University of Texas at Austin, Department of Chemistry August **2025**
Ph.D. Chemistry, Analytical Chemistry GPA 4.0
Advisor: Prof. C. Buddie Mullins
Thesis: Effects of the reaction environment on the performance of electrocatalysts for alkaline water electrolysis

Universidad Autónoma de Chihuahua, Department of Chemistry June **2020**
M.S. Chemistry, *Suma Cum Laude* GPA 4.0
Advisor: Prof. Víctor Hugo Ramos-Sánchez
Thesis: Evaluating and Optimizing Sulfite Electrooxidation in a Parallel-plate Reactor

Universidad Autónoma de Chihuahua, Department of Chemistry November **2017**
B.S. Chemical Engineering, *Suma Cum Laude* GPA 4.0
Advisor: Prof. Víctor Hugo Ramos-Sánchez
Thesis: Electrochemical Membrane Reactor for the Hybrid Thermochemical Sulfur-Ammonia Cycle

SCIENTIFIC PUBLICATIONS

Google Scholar page

Completed as a Ph.D. student at UT-Austin:

28. **Marquez, R.A.**, Bender, J.T., Aleman, A., Kalokowski, E., Le, T.V., Williamson, C., Frederiksen, M.L., Kawashima, K., Chukwuneke, C., Dolocan, A., Milliron, D.J., Resasco, J., Jaramillo, T.F., Mullins, C.B. Insights into Catalyst Degradation During Alkaline Water Electrolysis Under Variable Operation. *Energy & Environmental Science*, **2025**, In press. Link
27. **Marquez, R.A.**, Bender, J.T., da Cunha, S., Aleman, A., Sahu, A., Ganesan, V., Milliron, D.J., Resasco, J., Jaramillo, T.F., Mullins, C.B. Tracking Local pH Dynamics During Water Electrolysis via In-line Continuous Flow Raman Spectroscopy. *ACS Energy Letters*. **2025**, 10, 4, 2075–2083. Link
26. López-Cervantes, V.B., Obeso, J.L., Flores, J.G., Gutiérrez-Alejandre, A., **Marquez, R.A.**, De los Reyes, J.A., Flores, C.V., Portillo-Vélez, N.S., Marín Rosas, P., Celaya, C.A., González-Zamora, E., Solis-Ibarra, D., Peralta, R.A., Ibarra, I.A. Formation of polysulfides as a smart strategy to selectively detect H_2S in a Bi(iii)-based MOF material. *Chemical Science*. **2025**, 16, 5483-5492. Link
25. Kawashima, K., Milton, A.E.F., Archer, J., Collins, D., Lorenzo Serrat, N., Chukwuneke, C., **Marquez, R.A.**, Smith, L.A., Mullins, C.B. Incidental and Intentional Transformation: Transition Metal Pnictide and Chalcogenide Electrocatalysts for Alkaline Hydrogen Evolution. *ACS Energy Letters*, **2024**, 9, 6126–6143. Link
24. **Marquez, R.A.**, Kalokowski, E., Espinosa, M., Ramos-Sánchez, V.H., Rodríguez-Pacheco, L.C., Valenzuela-De la Rosa, F., Mullins, C.B. Teaching Electrochemical Energy Conversion and Storage Through Active Learning: Insights from Science Workshops. *Journal of Chemical Education*, **2024**, 101, 8, 3333–3343. Link
23. Smith, L.A., Kawashima, K., **Marquez, R.A.**, Mullins, C.B. A Perspective on Protective Carbon Shells for Improved Stability of Alkaline Water Oxidation Electrocatalysts. *ACS Materials Letters*, **2024**, 6, 3190–3201. Link
22. **Marquez, R.A.**, Obeso, J.L., Vaidyula, R.R., López-Cervantes, V.B., Peralta, R.A., Marín Rosas, P., De los Reyes, J.A., Mullins, C.B., Ibarra, I.A. From Pollution to Energy Storage: Leveraging Hydrogen Sulfide with SU-101 Cathodes in Lithium-Sulfur Batteries. *Journal of Materials Chemistry A.* **2024**, 12, 32735-32744. Link
21. **Marquez, R.A.**, Oefelein, E.E., Le, T.V., Kawashima, K., Le, T.V., Smith, L.A., Mullins, C.B. Redefining the Stability of Water Oxidation Electrocatalysts: Insights from Materials Databases and Machine Learning. *ACS Materials Letters*, **2024**, 6, 7, 2905–2918. Link

20. **Marquez, R.A.**, Espinosa, M., Kalokowski, E., Son, Y.J., Kawashima, K., Le, T.V., Chukwuneke, C.E., Mullins, C.B. A Guide to Electrocatalyst Stability Using Lab-Scale Alkaline Water Electrolyzers. *ACS Energy Letters*, **2024**, 9, 2, 547–555. Link
19. **Marquez, R.A.**, Kalokowski, E., Espinosa, M., Bender, J.T., Son, Y.J., Kawashima, K., Chukwuneke, C., Smith, L.A., Celio, H., Dolocan, A., Zhan, X., Miller, N.R., Milliron, D.J., Resasco, J., Mullins, C.B. Transition metal incorporation: electrochemical, structure, and chemical effects on nickel oxyhydroxide oxygen-evolution electrocatalysts. *Energy & Environmental Science*, **2024**, 17, 2028-2045. Link
18. Kawashima, K.,* **Marquez, R.A.**,* Smith, L.A., Vaidyula, R.R., Carrasco-Jaim, O.A., Wang, Z., Son, Y.J., Cao, C.L., Mullins, C.B. A Review of Transition Metal Boride, Carbide, Pnictide, and Chalcogenide Water Oxidation Electrocatalysts. *Chemical Reviews*, **2023**, 123, 23, 12795–13208. Link **Equal contributors.*
17. Chukwuneke, C., Kawashima, K., Li, H., **Marquez, R.A.**, Son, Y.J., Celio, H., Henkelman, G., Mullins, C.B. Electrochemically Engineered Domain: Nickel–Hydroxide/Nickel Nitride Composite for Alkaline HER Electrocatalysis. *Journal of Materials Chemistry A*, **2023**, 12, 1654-1661. Link
16. Son, Y.J., **Marquez, R.A.**, Kawashima, K., Smith, L.A., Chukwuneke, C., Babauta, J., Mullins, C.B. Navigating *iR* Compensation: Practical Considerations for Accurate Study of Oxygen Evolution Catalytic Electrodes. *ACS Energy Letters*, **2023**, 8, 10, 4323–4329. Link
15. **Marquez, R.A.**, Kawashima, K., Son, Y.J., Castelino, G., Miller, N.R., Smith, L.A., Chukwuneke, C., Mullins, C.B. Getting the Basics Right: Preparing Alkaline Electrolytes for Electrochemical Applications. *ACS Energy Letters*, **2023**, 8, 2, 1141–1146. Link
14. Kawashima, K., **Marquez, R.A.**, Son, Y.J., Guo, C., Vaidyula, R.R., Smith, L.A., Chukwuneke, C., Mullins, C.B. Accurate Potentials of Hg/HgO Electrodes: Practical Parameters for Reporting Alkaline Water Electrolysis Overpotentials. *ACS Catalysis*, **2023**, 13, 3, 1893–1898. Link
13. Son, Y.J., Kawashima, K., **Marquez, R.A.**, Smith, L.A., Chukwuneke, C., Mullins, C.B. Key concepts for understanding alkaline oxygen evolution reaction at the atomic/molecular scale. *Current Opinion in Electrochemistry*, **2023**, 39, 101298. Link
12. Wang, Z., Diao, J., Kawashima, K., Weeks, J.A., Vaidyula, R.R., **Marquez, R.A.**, Miller, N.R., Henkelman, G., Mullins, C.B. Unveiling the reaction mechanism of capacity reactivation in silver vanadate cathodes for aqueous zinc-ion batteries. *Journal of Materials Chemistry A*, **2023**, 11, 35, 18881-18892. Link
11. **Marquez, R.A.**, Kawashima, K., Son, Y.J., Rose, R., Smith, L.A., Miller, N.R., Carrasco-Jaim, O.A., Celio, H., Mullins, C.B. Tailoring 3D-Printed Electrodes for Enhanced Water Splitting. *ACS Applied Materials & Interfaces*, **2022**, 14, 37, 42153–42170. Link
10. Son, Y.J., Kim, S., Leung, V., Kawashima, K., Noh, J., Kim, K., **Marquez, R.A.**, Carrasco-Jaim, O.A., Smith, L.A., Celio, H., Milliron, D.J., Korgel, B.A., Mullins, C.B. Effects of Electrochemical Conditioning on Nickel-Based Oxygen Evolution Electrocatalysts. *ACS Catalysis*, **2022**, 12, 16, 10384–10399. Link
9. Kawashima, K., **Marquez-Montes, R.A.**, Li, H., Shin, K., Cao, C.L., Vo, K.M., Mullins, C.B. Electrochemical behavior of a Ni_3N OER precatalyst in Fe-purified alkaline media: the impact of self-oxidation and Fe incorporation. *Materials Advances*, **2021**, 2, 7, 2299-2309. Link
8. **Marquez-Montes, R.A.**, Kawashima, K., Son, Y.J., Weeks, J.A., Sun, H.H., Celio, H., Mullins, C.B. Mass transport-enhanced electrodeposition of Ni–S–P–O films on nickel foam for electrochemical water splitting. *Journal of Materials Chemistry A*, **2021**, 9, 12, 7736-7749. Link
7. **Marquez-Montes, R.A.**, Kawashima, K., Vo, K.M., Chávez-Flores, D., Collins-Martínez, V.H., Mullins, C.B., Ramos-Sánchez, V.H. Simultaneous sulfite electrolysis and hydrogen production using Ni foam-based three-dimensional electrodes. *Environmental Science & Technology*, **2020**, 54, 19, 12511-12520. Link
6. Kawashima, K., Cao, C.L., Li, H., **Marquez-Montes, R.A.**, Wygant, B.R., Son, Y.J., Mullins, C.B. Evaluation of a V_8C_7 Anode for Oxygen Evolution in Alkaline Media: Unusual Morphological Behavior. *ACS Sustainable Chemistry & Engineering*, **2020**, 8, 37, 14101-14108. Link

Papers Prior to Attendance at UT-Austin

5. Orozco-Mena, R.E., **Marquez, R.A.**, Mora-Domínguez, K.I., Collins-Martinez, V.H., Herrera-Peraza, E.F., Perez-Vega, S.B., Ramos-Sánchez, V.H. Implementing a sustainable photochemical step to produce value-added products in flue gas desulfurization. *Chemical Engineering Journal*, **2020**, 430, 133072. Link
4. Sánchez-Hernández, L.J., Ramírez-Romero, P., Rodríguez-González, F., Ramos-Sánchez, V.H., **Marquez-Montes, R.A.**, Romero-Paredes Rubio, H., Jonathan, M.P. Seasonal evidences of microplastics in environmental matrices of a tourist dominated urban estuary in Gulf of Mexico, Mexico. *Chemosphere*, **2021**, 277, 130261. Link
3. **Marquez-Montes, R.A.**, Orozco-Mena, R.E., Camacho-Dávila, A.A., Pérez-Vega, S., Collins-Martínez, V.H., Ramos-Sánchez, V.H. Optimization of the electrooxidation of aqueous ammonium sulfite for hydrogen production at near-neutral pH using response surface methodology. *International Journal of Hydrogen Energy*, **2020**, 45, 27, 13821-13831. Link
2. **Marquez-Montes, R.A.**, Collins-Martínez, V.H., Pérez-Reyes, I., Chávez-Flores, D., Graeve, O.A., Ramos Sánchez, V.H. Electrochemical engineering assessment of a novel 3D-printed filter-press electrochemical reactor for multipurpose laboratory applications. *ACS Sustainable Chemistry & Engineering*, **2020**, 8, 9, 3896-3905. Link
1. **Marquez-Montes, R.A.**, Orozco-Mena, R.E., Lardizábal-Gutiérrez, D., Chávez-Flores, D., López-Ortíz, A., Ramos-Sánchez, V.H. Sulfur dioxide exploitation by electrochemical oxidation of sulfite in near-neutral pH electrolytes: A kinetics and mechanistic study. *Electrochemistry Communications*, **2019**, 104, 106481. Link

Manuscripts submitted

Marquez, R.A., Kawashima, K., Brownell, M., Reza-Amaro, D., Mullins, C.B. A Guide to Experimental Practices in Electrocatalysis Research. Proposal accepted by *Chemical Reviews.*

Manuscripts in preparation

Marquez, R.A., Nielander, A., Resasco, J., Jaramillo, T.F., Mullins, C.B. An overview of electrochemical approaches to harness the ocean's potential to capture carbon dioxide. Perspective article invited by *ACS Energy Letters.*

AWARDS AND HONORS

2025 CAS Future Leaders 2025, The American Chemical Society
2025 NAM29 Kokes Award, The North American Catalysis Society
2025 Energy Technology Division Graduate Student Award, The Electrochemical Society
2025 Ethel Gene Kahmer Endowed Presidential Fellowship, UT-Austin
2025 Schmidt Science Fellows (Finalist)
2025 Stanford Energy Postdoctoral Fellowship (Finalist)
2024 CATL-ChemCatBio Graduate Student Travel Award, The American Chemical Society
2024 Edward G. Weston Summer Fellowship, The Electrochemical Society
2024 Jeff Byers Memorial Graduate Award in Chemistry and Chemical Engineering, UT-Austin
2024 #RSCPoster competition 2024 (1st place, Energy category), The Royal Society of Chemistry
2024 #RSCPosterPitch Award 2024, The Royal Society of Chemistry
2024 Chemistry Department Service Award 2024, UT-Austin
2023 ECS Texas Section Travel Award, 244th ECS Meeting, The Electrochemical Society
2023 General Student Poster Session Award (1st), 243rd ECS Meeting, The Electrochemical Society
2023 ECS Texas Section Travel Award, 243rd ECS Meeting, The Electrochemical Society
2023 Morton Share Trust Graduate Fellowship
2022 Master Thesis Competition (1st place), Mexican Hydrogen Society

2021 Faraday 2021 Teaching Award, UT-Austin
2021 Henze 2021 Teaching Award, UT-Austin
2021 Chemistry Department Service Award 2021, UT-Austin
2021 International Doctoral Fellowship Program, CONAHCyT
2020 Provost's Graduate Excellence Fellowship, UT-Austin
2020 Royston M. Roberts Fellowship in Chemistry
2020 Maddin Endowed Scholarship in Chemistry
2019 Matías Romero Visiting Scholars Fellowship
2017 Harry West Student Poster Award (1st place), AIChE Annual Meeting

GRANTS AND FELLOWSHIPS

2024 **Edward G. Weston Summer Fellowship,** The Electrochemical Society
Proposal: Understanding the Effects of Intermittent Water Electrolysis on Transition Metal (Oxy)hydroxide Oxygen Evolution Electrocatalysts
Research Fellowship | US$5,000

2021 **International Doctoral Fellowship,** CONAHCyT / University of Texas System
Proposal: 3D printing Approaches for Electrochemical Water Splitting: Incorporating Advanced Features into Water Electrolysis Technologies
Graduate Research Fellowship | US$132,000 for over four years

2020 **Provost's Graduate Excellence Fellowship,** The University of Texas at Austin
Graduate Research Fellowship | US$130,000 for over five years

Travel Awards (Totaling US$2,900)

2025 College of Natural Sciences Professional Development Award (UT Austin)
2024 CATL-ChemCatBio Graduate Student Travel Award
2024 ECS Texas Section Travel Award (245th ECS Meeting)
2024 Chemistry Department Professional Development Travel Award (UT Austin)
2024 Center for Electrochemistry Travel Grant
2023 ECS Texas Section Travel Award (244th ECS Meeting)
2023 ECS Texas Section Travel Award (243rd ECS Meeting)

PROFESSIONAL ACTIVITIES AND AFFILIATIONS

Peer Reviewer: Materials Horizons, Journal of the Electrochemical Society, International Journal of Hydrogen Energy, Journal of Physical Chemistry, Chemistry of the Materials

Materials Horizons Community Board Member, Royal Society of Chemistry (2023–Present)

Secretary, UT-Austin ECS Student Chapter (2023–Present)

Instructor and Ambassador, Clubes de Ciencia MX (2023–Present)

Memberships: Royal Society of Chemistry, American Chemical Society, American Institute of Chemical Engineers, Society of Hispanic Professional Engineers, Electrochemical Society.

INVITED TALKS

2025 **Electrocatalysis Rigor & Reproducibility Workshop,** Seattle, WA
Getting the Basics Right: Electrolyte Essentials for Electrocatalysis.

2025 **247th ECS Meeting,** Montreal, Canada

Intermittency Intensifies Catalyst Transformations and Degradation in Liquid Alkaline Water Electrolysis (ETD Graduate Student Award sponsored by BioLogic).

2024 **PRiME 2024,** Honolulu, HI
Active Learning Strategies for Teaching Electrochemical Energy Conversion and Storage: Insights from Science Clubs.

2024 **Fall Seminar Series, Chemistry Department at UACH,** Chihuahua, Mexico
The Devil is in the Impurities: Understanding the Influence of Transition Metal Impurities.

2023 **Electrochemistry Chalk Talks Series, UT-Austin ECS Chapter,** Austin, TX
Mastering the Art of Composing Scientific Graphics. Recording

2023 **Fall Seminar Series, Chemistry Department at UNAM,** Mexico City, Mexico
The Devil is in the Impurities: Understanding the Influence of Transition Metal Impurities.

2023 **Chemistry Recruitment 2023, UNAM / UAM / IPN / UANL,** Mexico City, Mexico
The Road to Grad School. A Guide to Joining the PhD Program in Chemistry.

2023 **Electrochemistry Chalk Talks Series, UT-Austin ECS Chapter,** Austin, TX
Understanding Electrochemical Double Layer Capacitance Measurements. Recording

2023 **Hispanic Engineers Leadership Series, AIChE Chapter at UANL,** Monterrey, Mexico
Splitting Water with Electrons: Powering a Safer and Greener Future. Plenary Speaker.

2020 **Energy and Society Virtual Plenary Session, UABC**, Zoom (Online)
Unraveling Electrochemical Water Splitting: Are Electrocatalysts Truly Stable? Recording

2020 **ECS Monthly Webinars Plenary Session, UT-Austin**, Zoom (Online)
Hydrogen from Sulfite Electrolysis: Toward the Rational Design and Optimization of Practical Electrochemical Flow Cell Systems.

TALKS PRESENTED AT CONFERENCES

2024 **AIChE Annual Meeting 2024,** San Diego, CA
Reconstruction of Transition Metal (Oxy)Hydroxide Electrocatalysts Induced By Intermittent Water Electrolysis.

2024 **PRiME 2024,** Honolulu, HI
Reconstruction and Dissolution of Transition Metal (Oxy)Hydroxide Electrocatalysts Induced By Intermittent Water Electrolysis.

2024 **PRiME 2024,** Honolulu, HI
Incorporation of Trace Metals through in situ Cation Exchange Reactions: Electrochemical and Structural Effects on Nickel Oxyhydroxide Electrocatalysts.

2024 **ACS Fall 2024,** Denver, CO
Incorporation of trace metals in situ through cation exchange: Electrochemical and structural effects on nickel oxyhydroxides.

2024 **ACS Fall 2024,** Denver, CO
Teaching electrochemical energy conversion and storage through active learning: Insights from summer science clubs.

2024 **245th ECS meeting,** San Francisco, CA
Dynamic Activity and Stability of Transition Metal (oxy)Hydroxide Oxygen Evolution Electrocatalysts Under Steady and Intermittent Operation.

2023 **244th ECS meeting,** Gothenburg, Sweden

Understanding the Effects of Transition Metal Impurities on Nickel (oxy)hydroxide Electrocatalysts.

2022 **ChemE Future Faculty Diversity Seminar Series,** Zoom (Online)
Taking the Next Step in Electrocatalysis: Closing Gaps Between Lab-scale Electrochemistry and Electrochemical Engineering.

2019 **14th HYPOTHESIS International Symposium**, Foz do Iguaçu, Brazil
Sulfur dioxide exploitation by electrochemical oxidation of sulfite in near-neutral pH *via* the S-NH_3 Cycle.

2017 **AIChE Annual Meeting, AIChE**, Minneapolis, Minnesota
Design of an Electrochemical Reactor for Hydrogen Production *via* the Sulfur-Ammonia Cycle.

2016 **Young Researchers Symposium, CONACyT**, Guanajuato, Mexico
Design of an Ion-Exchange Membrane Electrochemical Reactor for Hydrogen Production *via* the S-NH_3 Cycle

POSTERS PRESENTED AT CONFERENCES

2025 **2025 Bard CEC Workshop on Electrochemistry,** Austin, TX
Trace Metal Incorporation through in Situ Cation Exchange: Effects on Energy Conversion and Storage Properties.

2024 **2024 AIChE Annual Meeting,** San Diego, CA
Trace Metal Incorporation through in Situ Cation Exchange: Effects on Energy Conversion and Storage Properties (Meet the Faculty and Post-Doc Candidates Poster Session).

2024 **PRiME 2024,** Honolulu, HI
Benchmarking Electrocatalyst Stability Tests Using Lab-Scale Alkaline Water Electrolyzers.

2024 **ACS Fall 2024,** Denver, CO
Testing electrocatalyst stability using lab-scale alkaline water electrolyzers: A guide to experimental practices.

2024 **245th ECS meeting,** San Francisco, CA
A Guide to Electrocatalyst Stability Using Lab-Scale Alkaline Water Electrolyzers.

2024 **#RSCPoster competition,** LinkedIn (Online) Poster Pitch
Trace Metal Incorporation Through In Situ Cation Exchange: Effects on Energy Conversion and Storage Properties.

2023 **243rd ECS meeting with SOFC-XVIII,** Boston, MA
Six Practices to Improve Alkaline Electrolyte Preparation. General Student Poster Session Award.

2023 **CEC Annual Workshop on Electrochemistry, UT-Austin**, Austin, TX
Six Steps to Prepare Alkaline Electrolytes for Electrochemical Applications.

2022 **LatinXChem 2022 Virtual Poster Session, LatinXChem**, Twitter (Online)
Tailoring 3D-Printed Electrodes for Enhanced Water Splitting.

2021 **ACS Southwest Regional Meeting Poster Session, ACS,** Austin, TX
Flow Cell-Assisted Electrodeposition of Ni-S-P-O Films for Electrochemical Water Splitting.

2021 **LatinXChem 2021 Virtual Poster Session, LatinXChem**, Twitter (Online)
Flow Cell-Assisted Electrodeposition of Ni-S-P-O Films on Nickel Foam for Electrochemical Water Splitting. Poster Pitch

2020 **CEC Annual Workshop on Electrochemistry, UT-Austin**, Austin, TX
Simultaneous sulfite electrolysis and hydrogen production in a 3D-printed electrochemical reactor.

2019 **CEC Annual Workshop on Electrochemistry, UT-Austin**, Austin, TX
Electrochemical Oxidation of Sulfite in Near-Neutral pH Electrolytes: A Kinetics Study.

2017 **Annual AIChE Student Conference, AIChE**, Minneapolis, MN
Design of a Novel Electrochemical Membrane Reactor for Hydrogen Production via the Sulfur-Ammonia Water-Splitting Cycle.

2016 **Green & Sustainable Chemistry Conference, Elsevier**, Berlin, Germany
Design of an Ion-Exchange Membrane Electrochemical Reactor for Hydrogen Production

RESEARCH EXPERIENCE

Graduate Research Assistant, The University of Texas at Austin — August **2020- Present**
- Investigated the effects of intermittent water electrolysis on catalytic stability.
- Studied the effects of metal impurity incorporation into water oxidation catalysts.
- Developed protocols to test electrocatalyst stability and purify alkaline electrolytes.
- Authored a review on water oxidation catalysis from over 890 peer-reviewed reports.
- Employed statistical and machine learning methods to analyze catalyst databases.
- Designed and built 12+ custom electrochemical cells for *in situ* and *operando* characterization.
- Implemented flexible automation to accelerate the electrodeposition of catalytic thin films.
- Studied the impact of electrode architecture on bubble growth and detachment.
- Collaborated with Mexican researchers to use SU-101 MOFs in lithium-sulfur batteries.

Visiting Scholar, The University of Texas at Austin — Fall **2019**
- Characterized Pd and Ni catalysts for sulfite electrooxidation.
- Synthesized transition metal nitride water-splitting electrocatalysts.

Graduate Research Assistant, UACH — August **2018**-June **2020**
- Designed an electrochemical flow cell for sulfite electrooxidation.
- Designed and built 6+ flow cells using 3D printing.
- Investigated hydrodynamics and mass transfer properties of electrochemical flow cells.
- Studied the kinetics of sulfite ion electrooxidation on Pd electrocatalysts.

Undergraduate Research Assistant, Universidad Autonoma de Chihuahua — August **2015**-June **2017**
- Formulated a proof-of-concept process for sulfite electrooxidation.
- Simulated a flue gas desulfurization plant to capture sulfur dioxide.

TEACHING EXPERIENCE

International Instructor, Clubes de Ciencia MX — Summer **2022**, Summer **2023,** Winter **2025**
Designed and taught two workshops on electrochemical energy technologies. Referred publication

Teaching Assistant, UT-Austin — Fall **2020**-Spring **2021**
Taught two terms of Introduction to Chemical Practice and received two teaching awards.

GRS 097: Fundamentals for Teaching Assistants, UT-Austin — Fall **2020**
Completed a semester-long pedagogy course for graduate teaching assistants.

Teaching Assistant, UACH — Fall **2017**-Spring **2018**
Taught undergraduate Physical Chemistry and graduate Instrumental Analysis courses.

DEPARTAMENTAL SERVICE

Graduate Recruiter and Student Host, Department of Chemistry**,** UT-Austin — **2021**-**2024**
Hosted eight visiting students and delivered six recruiting seminars at the top Mexican universities.

Mentored 10+ applicants and offered 40+ hours of practice for the TOEFL and IELTS exams.

VOLUNTEERING

Full description

Ambassador, Clubes de Ciencia MX **2024-Present**
Secretary, UT-Austin ECS Student Chapter **2023-Present**
Young leader, Mexican Red Cross **2009-2013**

ENTREPRENEURIAL ACTIVITIES

Full description

Mentor, VirtAgro **2021**
Entrepreneurship Training, UNAM/Santander **2019**
Entrepreneur Leader, H24U, National Science Foundation / CONACyT **2019**
Received training from the NSF I-Corps program.

SCIENCE COMMUNICATION

Full description

Catalastic! YouTube Channel
Energy Across Living Oceans, Clubes de Ciencia MX Winter **2025**
Bright Spikes! Electrifying Chemical Reactions, Clubes de Ciencia MX Summer **2023**
Electrochemistry: How Do We Transport Energy? Clubes de Ciencia MX Summer **2022**
Quantum Chemistry for Kids, UACH **2019**
From Photons to Electrons, Clubes de Ciencia MX **2018**
Science Podcasts and Talk Shows, UACH **2016**

STUDENTS MENTORED

Chloe Williamson, Undergraduate student, Chemical Engineering, UT-Austin (2024-Present)
Thuy Vy Le, Undergraduate student, Chemistry, UT-Austin (2023-2024)
Daniel Y. Ko, Undergraduate student, Chemical Engineering, UT-Austin (2023)
Michael Espinosa, Undergraduate student, Chemistry, UT-Austin (2023-Present)
Emma Kalokowski, Undergraduate student, Chemistry, UT-Austin (2022-Present)
Grace Castellino, Undergraduate student, Chemistry, UT-Austin (2022)
Grayson Constantine, Undergraduate student, Chemistry, UT-Austin (2022)
Sergio Ochoa, Undergraduate student, Chemical Engineering, UACH (2023-Present)

CERTIFICATIONS

2023 IOP Peer Review Excellence, IOP Publishing