

Claudio Adrián Ruiz Torres

Claudio.ruiz@mail.utoronto.ca, +1-437-255-22-69

415 Jarvis Street, Toronto ON, Canada, M4Y 3C1

Education

Visiting Graduate Researcher, Department of Chemical Engineering & Applied Chemistry 2022-Current
University of Toronto, Canada
PhD Candidate, Chemical and Biomolecular Engineering 2018-Current
Korea Advanced Institute of Science and Technology (KAIST)
Master's of Science, Nanotechnology, Nanoscience and Renewable Energies 2015-2017
Autonomous University of San Luis Potosí, Mexico
Bachelor of Applied Science, Nanotechnology, Nanoscience and Renewable Energies 2009-2015
Autonomous University of San Luis Potosí, Mexico

Research Experience

PhD student researcher 2018-Current

Korea Advanced Institute of Science and Technology (KAIST)

Chemical and Biomolecular Engineering

Advisor: Prof. Hee-Tae Jung

- Development, test and analysis of 1D and 2D carbon-based materials (Graphene, Graphene Oxide, Graphene Oxide Nanoribbons) for new generation membrane separation process
- Water purification and desalination by membrane separation processes
- Synthesis of highly absorbent carbon-based materials for radioactive and organic contaminants removal from water

Research assistant 2017-2018

Autonomous University of San Luis Potosí, Mexico

Faculty of Science

- Synthesis and characterization of metallic and metal oxide nanomaterials (Ag, Fe, Fe₂O₄, TiO₂) for advanced water treatment by heavy metal removal, water disinfection, and the degradation of organic emergent contaminants
- Evaluation of antibacterial and antibiofilm properties of nanomaterials and surfaces for biomedical applications
- Establishment of private-public partnerships for the industrial application of advanced materials

Master student researcher 2015-2017

Autonomous University of San Luis Potosí, Mexico

Faculty of Science

Advisor: Prof. Gabriel Martinez and Prof. Yuhoon Hwang

- Functionalization of nanomaterials based on zero valent iron for nitrate reduction and heavy metal removal from water

Visiting graduate researcher January 2017- August 2017

Seoul National University of Science and Technology, South Korea

Environmental Engineering

Advisor: Prof. Yuhoon Hwang

- Synthesis and characterization of highly reactive and efficient iron-based nanomaterials for simulated wastewater treatment and heavy metals removal

Undergraduate Student Researcher

2013- 2014

Autonomous University of San Luis Potosí, Mexico
College of Engineering

- Water chemistry and quality analysis in samples of surface water, groundwater, and soil

Skills

Computer: ArcGis, AutoCAD, AutoDesk Fusion 360, GeoSoft, Grapher, Granphad, OriginLab, Adobe Illustrator, Adobe Photoshop, Sketchup 3D, Blender, Rhino 3D, Microsoft Office.

Languages: Spanish (mother tongue), English (advanced), Korean (basic)

Technical: Experience in bottom-up and top-down material fabrication (Synthesis of advanced metallic, oxide metallic, non-metallic nanomaterials carbon-based two and one-dimensional nanomaterials (Graphene oxide, reduced Graphene oxide and Graphene oxide nanoribbons), 3D graphene-based structures). Materials Functionalization. Operation and data interpretation of characterization techniques: UV-Vis absorption spectroscopy, UV- Vis diffuse reflectance spectroscopy, NIR-Infrared spectroscopy, Fluorescence spectroscopy, Fourier transform infrared spectroscopy, Raman spectroscopy, X-ray diffraction, XRD data Rietveld refinement, Atomic Force Microscopy (AFM), thermal gravimetric analysis (TGA), nitrogen isothermal adsorption instrument, Brunauer–Emmett–Teller (BET), Zeta-Potential, and Dynamic Light Scattering (DLS), water contact angle. X-ray photoelectron spectroscopy (XPS). Scanning electron microscope (SEM). Antibacterial properties evaluation of surfaces and nanomaterials. Application of nanomaterials to catalytic reactions for water treatment. Nanostructured and multifunctional membranes preparation
Membrane separation process: Pressure driven separation (Reverse osmosis, nanofiltration), Forward osmosis, Organic solvent nanofiltration.

Scientific Publications

1. **Claudio Adrian Ruiz-Torres**, René Fernando Araujo-Martínez, Gabriel Alejandro Martínez-Castañón, J. Elpidio Morales-Sánchez, Jesús María Guajardo-Pacheco, Jesús González-Hernández, Tae Jin Lee, Hyun Sang Shin, Yuhoon Hwang, and Facundo Ruiz. 2018. "Preparation of Air Stable Nanoscale Zero Valent Iron Functionalized by Ethylene Glycol without Inert Condition." *Chemical Engineering Journal* 336 (August 2017). Elsevier: 112–22.
2. María Del Carmen Sánchez-Navarro, **Claudio Adrian Ruiz-Torres**, Nereyda Niño-Martínez, Roberto Sánchez-Sánchez, Gabriel Alejandro Martínez-Castañón, I. DeAlba-Montero, and Facundo Ruiz. 2018. "Cytotoxic and Bactericidal Effect of Silver Nanoparticles Obtained by Green Synthesis Method Using Annona Muricata Aqueous Extract and Functionalized with 5-Fluorouracil." *Bioinorganic Chemistry and Applications* 2018: 6506381.
3. **Claudio Adrian Ruiz-torres**, René Fernando Araujo-martínez, Gabriel Alejandro Martínez-castañón, Abel Hurtado-macias, J Elpidio Morales-sánchez, Tae-jin Lee, Hyun-sang Shin, Yuhoon Hwang, and Facundo Ruiz. 2019. "A Cost-Effective Method to Prepare Size-Controlled Nanoscale Zero-Valent Iron for Nitrate Reduction." *Environmental Engineering Research* 24 (3): 463–73.
4. Cho, Kyeong Min, Hyeong-Jin Lee, Yoon Tae Nam, Yong-Jae Kim, Chansol Kim, Kyoung Min Kang, **Claudio Adrian Ruiz Torres**, Dae Woo Kim, and Hee-Tae Jung. 2019. "Ultrafast-Selective Nanofiltration of a Hybrid Membrane Comprising Laminated Reduced Graphene Oxide/Graphene Oxide Nanoribbons." *ACS Applied Materials & Interfaces* 11 (30): 27004–10.
5. DeAlba-Montero*, **Claudio A. Ruiz-Torres***, Diana P. Portales-Pérez, Fidel Martínez-Gutierrez, Félix Echeverría, Martha E. Compeán-Jasso, Yolanda G. Cataño-Cañizales, Facundo Ruiz. "Atmospheric corrosion, antibacterial properties, and toxicity of silver nanoparticles synthesized by two different routes". *Bioinorganic Chemistry and Applications*. 2020 (2020). (*) First author
6. **Claudio Adrian Ruiz Torres**, Kyoung Min Kang, Kyeong Min Cho, Yoon Tae Nam, Dae Woo Kim,

and Hee-Tae Jung. “Graphene-based Ultrafast Nanofiltration Membrane under Cross-Flow Operation: Effect of High-Flux and Filtered Solute on Membrane Performance”. Carbon 185 (2021): 641–49.

7. **Claudio Adrian Ruiz Torres**, Dae Woo Kim, and Hee-Tae Jung. “Precise Ion sieving enabled by oxidation-controlled nanoporous multilayer graphene”. In preparation.
8. **Claudio Adrian Ruiz Torres**, Yuhoon Hwang, and Hee-Tae Jung. “Oil adsorbent foam prepared using superhydrophobic one- and two-dimensional carbon-based materials”. In preparation.
9. **Claudio Adrian Ruiz Torres**, Yuhoon Hwang, and Hee-Tae Jung. “Porous reduced graphene oxide foam decorated with metal organic framework nanoparticles for radioactive water remediation”. In preparation.

Patents

1. Jesús María Guajardo Pacheco, Facundo Ruiz, **Claudio Adrian Ruiz Torres**., Process of reduction in humid way by electrochemical method to produce nanometallic colloids, metallic oxides or the deposition of nanometallic particles on the surface of fine particles. Mexican Patent IMPI-009-8592, 2017.03.28.
2. **Claudio Adrian Ruiz Torres**, Yuhoon Hwang, Facundo Ruiz., 고 분산성 산화 방지 철 나노입자의 합성방법 {Method for preparation of uniformly distributed and air stable nanoscale zerovalent iron}. Korean Patent (Application)

Trainings

Next Generation Water Action program 2022 Feb 2022- May 2022
Technical University of Denmark (DTU) startup accelerator lab, the International Water Association (IWA) and RAMBOLL company

Tsinghua Summer Global School 2021 Jun 2021-July 2021
Tsinghua University

- Award of the most investable project in “Future scenarios and innovation model of energy transition development in the context of carbon neutrality”

Global Youth Climate Challenges 2021, P4G summit Denmark May 2021
Ministry of Foreigners Affairs of Republic of South Korea, National council of climate and air quality of Republic of South Korea, South Korea

Expert Mentor at the Next Generation Water Action program 2021 Feb 2021- May 2021
Technical University of Denmark (DTU) startup accelerator lab and the International Water Association (IWA)

MIKTA Young Leaders' Cam Feb 2021
Ministry of Foreigners Affairs of Republic of South Korea, South Korea

Winter program on Korean economic development Jan 2021
Global Knowledge Exchange and Development Center, South Korea

K-water & UNESCO i-WSSM training program: Capacity Building Program on Innovative Technology Application for Water Security Nov 2020
K-water Academy and the UNESCO International Centre for Water Security and Sustainable Management, South Korea

K-water & UNESCO i-WSSM training program: Water supply management

K-water Academy and the UNESCO International Centre for Water Security and Sustainable Management, South Korea

Oct 2020

Environmental Remediation at Sites Impacted by Oil

Potosino Institute of Scientific and Technological Research, Mexico

Aug 2014