Exponent®
Engineering & Scientific Consulting

Laurent Delafontaine, Ph.D., P.E.

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Professional Profile

Dr. Delafontaine uses his technical knowledge as a chemical engineer to investigate incidents in the chemical processing and petroleum refining industries. He conducts risk assessments and analyzes hazard mitigation strategies. He applies analytical chemistry techniques and conducts chemical process simulation using HYSYS and fluid dynamics simulation using AFT Arrow to investigate industrial root cause analyses, perform origin and cause investigations, and solve industrial challenges.

Prior to joining Exponent, he was a Research Assistant at University of California, Irvine (UCI) where he researched catalyst syntheses. He conducted electrochemistry experiments and characterized catalysts using a variety of analytical techniques, including X-Ray photoelectron spectroscopy (XPS), scanning and transmission electron microscopy (SEM/TEM), X-Ray diffraction analysis (XRD), and chromatography methods (i.e., GC-MS/LC-MS) for product characterization. He invented a method to scale-up catalyst syntheses for industrial applications. This work developed his expertise on process industry standards and safety requirements.

Academic Credentials & Professional Honors

Ph.D., Chemical Engineering, University of California, Irvine, 2022

M.S., Chemical Engineering, Tulane University, 2016

B.S., Chemical Engineering, Tulane University, 2015

Licenses and Certifications

Professional Engineer Chemical, California, #7134

Certified Fire and Explosion Investigator (CFEI) (CA)

Prior Experience

Research Assistant in Dr. Plamen Atanassov Lab at UCI, 2019-2022

Associate Technical Professional, Halliburton Energy Services, Inc., 2017-2018

Professional Affiliations

National Fire Protection Association (NFPA)

The Electrochemical Society (ECS)

American Institute of Chemical Engineers (AIChE)

Publications

Ott, B, Delafontaine, L, Welchert, NA, Dee, S, Reza, A. Ensuring natural gas infrastructure is suitable for hydrogen service. Process Saf Prog. 2023; 1- 12. doi:10.1002/prs.12455

Delafontaine, L., Murphy, E., Guo, S., Liu, Y., Asset, T., Pan, X., Atanassov, P. (2022). Synergistic electrocatalytic syngas production from carbon dioxide by bi-metallic atomically dispersed catalysts. ChemElectroChem.

Ferri, M., Delafontaine, L., Guo, S., Asset, T., Cristiani, P., Campisi, S., Gervasini, A., & Atanassov, P. (2022). Steering Cu-Based CO2RR Electrocatalysts' Selectivity: Effect of Hydroxyapatite Acid/Base Moieties in Promoting Formate Production. In ACS Energy Letters (pp. 2304–2310). American Chemical Society (ACS).

Delafontaine, L., Cosenza, A., Murphy, E., Guo, S., Liu, Y., Chen, J., Atanassov, P. (2022). Metal-Nitrogen-Carbon Catalysts by Dynamic Template Removal for Highly Efficient and Selective Electroreduction of CO2. In ACS Applied Energy Materials (Manuscript No.: ae-2022-02811u (10.1021/acsaem.2c02811).

Guo, S., Liu, Y., Huang, Y., Wang, H., Murphy, E., Delafontaine, L., Chen, J., Zenyuk, I., Atanassov, P. (2022). Promoting electrolysis of carbon monoxide towards acetate and 1-propanol in flow electrolyzer. In ACS Energy Letters (Manuscript ID: nz-2022-02502d.R1).

Ozden, S., Delafontaine, L., Asset, T., Guo, S., Filsinger, K. A., Priestley, R. D., Atanassov, P., & Arnold, C. B. (2021). Graphene-based catalyst for CO2 reduction: The critical role of solvents in materials design. In Journal of Catalysis (Vol. 404, pp. 512–517).

Delafontaine, L., Asset, T., & Atanassov, P. (2020). Metal–Nitrogen–Carbon Electrocatalysts for CO 2 Reduction towards Syngas Generation. ChemSusChem, 13(7), 1688–1698. https://doi.org/10.1002/cssc.201903281.

Peer Reviews

International Society of Offshore and Polar Engineers (ISOPE)