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# Fatemeh Zebarjad, Ph.D., PMP

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## Professional Profile

Dr. Zebarjad serves clients across the energy, utilities, oil and gas, and petrochemical sectors requiring technical expertise in engineering analysis, materials performance, and complex process evaluation. She brings applied utility experience, where she supported engineering analyses related to material performance, pipeline integrity, root-cause failure analysis, and technology qualification in regulated energy infrastructure.

Her technical qualifications and experience support clients navigating infrastructure integrity, process performance, regulatory compliance, and strategic planning across traditional and emerging energy industries. Her expertise is particularly relevant to organizations operating within regulated energy infrastructure engaged in system reliability, safety, and compliance initiatives, including natural gas utilities and pipeline operators, public agencies and regulatory-facing entities. She supports oil and gas and petrochemical companies on technical issues related to chemical processing, reaction engineering, separations, and process-intensive technologies and stakeholders in emerging energy and decarbonization, including hydrogen, carbon capture, utilization, and storage (CCUS) developers and energy transition programs. Dr. Zebarjad is a certified project manager with experience managing scope, schedule, and budgets for utility projects up to $26 million, with a focus on CPUC regulatory compliance, risk analysis, and safety management.

Dr. Zebarjad's doctoral research was in chemical reaction engineering, including membrane reactors, high-pressure methanol synthesis, ionic-liquid-mediated separations, and recent experience has included carbon dioxide capture, utilization, and hydrogen production technologies, and experimental work related to enhanced oil recovery and oilfield chemistry. She has extensive hands-on experience with spectroscopic and analytical techniques, including GC-MS, FTIR, NMR, XRD, SEM, TEM, TGA, solid and liquid viscosity measurement equipment, and wettability and interfacial tension measurements, developed through more than a decade of experimental work. She regularly applies tools such as Aspen HYSYS, COMSOL Multiphysics, MATLAB, and AutoCAD to support modeling and analysis of technical processes. She is certified on ASTM DD3350, Standard Specification for Polyethylene Plastics Pipe and Fittings Materials, and has industry experience updating utility internal standards to align with ASTM requirements. She is proficient in California Air Resources Board (CARB) Low Carbon Fuel Standard (LCFS) credit frameworks, supporting industry leadership with financial insights related to credit optimization.

## Academic Credentials & Professional Honors

Ph.D., Chemical Engineering, University of Southern California, 2021

M.S., Petroleum Engineering, Texas A&M University, 2017

B.Sc., Chemical Engineering, Shiraz University, 2014

 

## Prior Experience

Project Manager III, Southern California Gas Company (SoCalGas), 2023-2025

Engineer II, Southern California Gas Company (SoCalGas), 2021-2023

Intern, California Resources Corporation (CRC), 2020

Lab Manager and Graduate Researcher, University of Southern California (USC), 2017-2021

Lab Manager and Graduate Researcher, Texas A&M University, 2015-2017

## Professional Affiliations

Project Management Institute (PMI)

National Fire Protection Association (NFPA)

American Institute of Chemical Engineers (AIChE)

Society of Petroleum Engineers (SPE)

## Patents

World Intellectual Property Organization (WIPO), WO2024112376A1: A reactive separation process for carbon dioxide capture from flue gas, May 2024 (Tsotsis TT, Jessen K, Zebarjad FS, Gong J, Bazmi M, Zhao L).

## Publications

Gong J, Zebarjad FS, Jessen K, Tsotsis T. An experimental and modeling study of the application of membrane contactor reactors to methanol synthesis using pure CO2 feeds. Chemical Engineering and Processing-Process Intensification 2023; 183:109241.

Zebarjad FS, Gong J, Li Z, Jessen K, Tsotsis T. Simulation of methanol synthesis in a membrane-contactor reactor. Journal of Membrane Science 2022; 661:120677.

Zebarjad FS, Wang Z, Li H, Hu S, Tang Y, Tsotsis TT. Investigation of CO2 and methanol solubility at high pressure and temperature in the ionic liquid [EMIM][BF4] employed during methanol synthesis in a membrane-contactor reactor. Chemical Engineering Science 2021; 242:116722.

Zebarjad FS, Hu S, Li Z, Tsotsis TT. Experimental investigation of the application of ionic liquids to methanol synthesis in membrane reactors. Industrial & Engineering Chemistry Research 2019; 58(27):11811–11820.

Mahdavi E, Zebarjad FS. Screening criteria of enhanced oil recovery methods. Fundamentals of Enhanced Oil and Gas Recovery from Conventional and Unconventional Reservoirs, Gulf Professional Publishing 2018; Elsevier, 41–59.

Mahdavi E, Zebarjad FS, Ayatollahi S, Taghikhani V. Experimental investigation on the effect of Asphaltene types on the interfacial tension of CO2–hydrocarbon systems. Energy & Fuels 2015; 29(12):7941–7947.

Mahdavi E, Zebarjad FS, Taghikhani V, Ayatollahi S. Effects of paraffinic group on interfacial tension behavior of CO2–asphaltenic crude oil systems. Journal of Chemical & Engineering Data 2014; 59(8):2563–2569.

**Presentations**

Gong J, Bazmi M, Zhao L, Yu K, Zebarjad FS, Li Z, Jessen K, Tsotsis T. Alcohol synthesis in a high-pressure membrane contactor reactor using waste CO2 feeds. In 2023 AIChE Annual Meeting, AIChE, 2023.

Zebarjad FS, Hu S, Tsotsis T. New application of ionic liquids as a sweep fluid in methanol synthesis in a membrane reactor. In 2019 AIChE Annual Meeting, AIChE, 2019.

Zebarjad FS, Nasr-El-Din HA, Badraoui DA. Effect of Fe III and chelating agents on performance of new VES-based acid solution in high-temperature wells. In SPE International Conference on Oilfield Chemistry (p. D021S007R003), SPE, 2017.

## Peer Reviews

Chemical Engineering and Processing-Process Intensification, Elsevier