

EPFL Valais/Wallis SEMINAR

07. 09. 2026, 10:30 - 11:30, EPFL Valais/Wallis in Sion, 4th floor, Zeuzier Room

Advanced Membrane Processes for Sustainable Water and Resource Recovery from Industrial Wastewater

Dr. Imen Bousrih

Center for Membrane Technology, Department of Chemistry and Bioscience, Aalborg University, Fredrik Bajers Vej 7H, 9220 Aalborg East, Denmark.

Growing water scarcity and increasing industrial wastewater generation have intensified the need for sustainable technologies that enable both water reuse and resource recovery. Advances in membrane materials and membrane engineering have driven significant progress across a broad range of separation technologies, including gas separation, carbon capture, water purification, and resource recovery from industrial streams [1]. Among these technologies, membrane distillation (MD) has emerged as a promising thermally driven separation process capable of treating highly saline and complex industrial wastewater while producing high-quality water. When integrated with membrane crystallization (MCr), MD enables the simultaneous recovery of high-purity water and valuable minerals, contributing to sustainable water management and the circular economy [2]. However, membrane scaling, wetting, and process optimization remain important challenges for achieving efficient and long-term operation. This work investigates the application of MD and MCr for industrial wastewater treatment, highlighting strategies to improve process performance, enhance water recovery, and promote controlled crystallization for resource recovery. These membrane-based technologies demonstrate the growing role of advanced separation processes in supporting sustainable industrial water management and resource efficiency.

References:

- [1] Baker, R. W. *Membrane Technology and Applications*, 3rd ed.; John Wiley & Sons: Chichester, U.K., 2012.
- [2] Curcio, E.; Drioli, E. Membrane Crystallization. *Ind. Eng. Chem. Res.* 2005, *44* (13), 4621–4632.
<https://doi.org/10.1021/ie049419>.



CV: Dr. Imen Bousrih

Born in Tunisia in 1992, Dr. Imen Bousrih obtained her degree in Chemistry from the University of Monastir before earning her Ph.D. in Structural and Polymeric (Bio)Organic Chemistry from the Faculty of Science of Tunisia in collaboration with Université Côte d'Azur, France. Her Ph.D. research focused on the synthesis and characterization of advanced polymeric materials and bio-inspired functional surfaces.

After completing her Ph.D., she joined the University of Oklahoma, USA, as a researcher, working on membrane surface modification and separation processes for industrial wastewater treatment. She subsequently became a Postdoctoral Fellow at the University of Arkansas, where she worked on the development and fabrication of advanced membrane materials for separation applications. Since 2025, she has been a Postdoctoral Fellow at Aalborg University, Denmark, where her research focuses on membrane distillation and membrane crystallization for sustainable industrial wastewater treatment and resource recovery within the European CORNERSTONE project.

École polytechnique fédérale de Lausanne (EPFL) Valais/Wallis
Institute of Chemical Sciences and Engineering (ISIC)
Basic Science Faculty (SB)
Energypolis, Rue de l'Industrie 17, CH-1950 Sion, Switzerland

