

ICB PhD public presentations**NOVEL HETEROGENOUS CATALYTIC APPROACHES FOR A SYNGAS-FREE ROUTE FOR METHANE VALORIZATION VIA ESTERIFICATION WITH TRIFLUORACETIC ACID****Andrea Blankenship**

ICB / The van Bokhoven Group

Supervisor: Prof. Dr. Jeroen A. van Bokhoven

Co-examiners: Prof. Dr. Unni Olsbye and Dr. Vladimir Paunovic



**24/10/2023, 3:30 pm, ETH Hönggerberg
HCI D 2 and on Zoom
(<https://ethz.zoom.us/j/62296513314>)**

Project Summary: The direct partial oxidation of methane to methanol has been actively sought for over a century to facilitate the production of fuels and chemicals. This pathway, however, is severely limited by fundamental challenges. Tandem esterification of methanol to oxidation-resistant methyl esters shows potential to overcome these barriers but has been limited by several shortcomings. This research rethinks this approach to move toward a practical methane conversion process. For the first time, solid catalysts are developed that are highly active and capable of using molecular oxygen for this reaction. New process conditions and configurations are developed, resulting in the first proof-of-concept study for a novel continuous heterogenous catalytic process. This development expands opportunities in acquiring pertinent catalytic and mechanistic data. Finally, impactful directions are highlighted for methane valorization research through holistic consideration of solid catalysts, product protection strategies, and process design.

CV: Andrea earned her BSc in Chemical Engineering from MIT and her MSc in Chemical and Bioengineering at ETH Zurich, completing a master's thesis in the group of Prof. Jeroen van Bokhoven. She continued in the group in 2020 with her doctoral studies.