

ICB PhD public presentations

HYDROFORMYLATION OF OLEFINS MEDIATED BY METAL-ORGANIC FRAMEWORKS

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01/06/2023, 1 pm

Paul Scherrer Institute OFLA/209 and on Zoom
(<https://ethz.zoom.us/j/64576007382>)

Project Summary: The hydroformylation of olefins is one of the industrially most relevant reactions promoted by a homogeneous catalyst. The process yields linear and branched aldehydes. The high demand for linear aldehydes led to the development of catalytic systems with high regioselectivity towards *normal* aldehydes, while the selective synthesis of the branched isomers is still challenging. The work focuses on exploiting and understanding the unique adsorption properties of metal-organic frameworks to obtain catalytic activities and selectivity not achievable by homogeneous and classical heterogeneous systems. The addition of Zn-MOF-74 to an unmodified cobalt catalyst allowed the conversion of unfunctionalized olefins to branched aldehydes with high selectivity. A similar catalytic system displayed tandem hydroformylation-aldol condensation activity comparable to the industrial Aldox process at milder conditions. Furthermore, nanoconfinement effects of Zn-MOF-74 on propene were investigated by *in situ* neutron powder diffraction.

CV: Patrick received his BSc (2017) and MSc (2019) in Chemistry from ETH Zurich. Since July 2019, he is pursuing his doctorate studies in the Syncat group at the Paul Scherrer Institute under the supervision of Dr. Marco Ranocchiari and Prof. Dr. Jeroen van Bokhoven.