

ICB PhD public presentations**STRONG-METAL-SUPPORT-EFFECTS IN HETEROGENEOUS CATALYSIS STUDIED BY IN SITU ELECTRON MICROSCOPY****Hannes Frey**

The van Bokhoven Group

Supervisor: Prof. Dr. Jeroen A. van Bokhoven

Co-examiners: Prof. Dr. Marc-Georg Willinger (TUM)
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**07/09/2023, 2 pm, ETH Hönggerberg
HIL E 10.1 and on Zoom
(<https://psich.zoom.us/j/8738516515>)**

Project Summary: This research delves deep into the behavior of noble metal particles under reactive conditions and is critical for catalysis advancements. Using in situ (Scanning) Transmission Microscopy, supported catalyst particles and their structural and chemical evolution in varying environments were studied. A significant observation was the dynamic nature of strong metal-support interaction induced particle encapsulation, and the dynamic behavior of platinum under redox-reactive settings. Further, platinum particle sintering rates were examined, revealing accelerated sintering in specific reactive conditions. Additionally, Platinum nanoparticle (NPs) encapsulation was explored as a viable pathway to prevent their sintering under high temperature oxidative conditions. This study uncovered how varied conditions influence the stability of NPs in challenging operational settings.

CV: Hannes Frey earned a M.Sc. in Bioengineering from Karlsruhe Institute of Technology in 2019. At ETH Zürich, he continued his studies jointly at the Department of Applied Biosciences and Chemistry (DCHAB) and Scientific Center of Optical and Electron Microscopy (ScopeM). Supervised by Prof. Jeroen Anton van Bokhoven and Prof. Marc Georg Willinger, his research spotlighted the complex dynamics of noble metal particles under reactive conditions.