

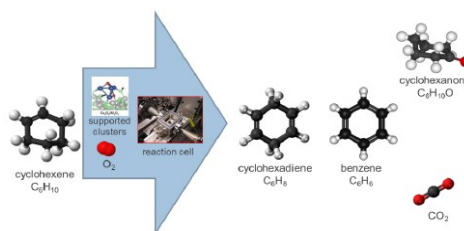
## SMS Spring 2023 Seminar Series

Friday Feb 17 | 3pm | Biodesign Auditorium

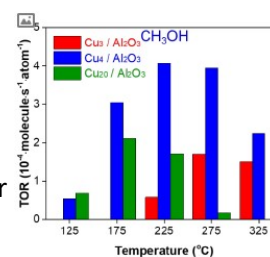
### Subnanometer size– and composition selected clusters in selective oxidative dehydrogenation and hydrogenation reactions: Size, composition and support effects

The presentation will discuss the catalysis by supported monodisperse subnanometer clusters made of a handful of atoms, supported on technologically relevant oxide- and model carbon-based supports.

In the first part of the presentation, the performance of Cu, Pd and CuPd clusters in the oxidative dehydrogenation of cyclohexene and cyclohexane will be discussed, where the atomic precision design of mono- and bimetallic clusters allows for the fine-tuning of their activity and selectivity by varying the composition of the clusters in an atom-by-atom fashion and by support effects.



In the second part of the presentation, the conversion of  $CO_2$  to methane vs. methanol on copper cluster-based catalysts will be discussed in the dependency of the supports used and cluster size.



## Štefan Vajda, PhD

*Dr. habil., J. Heyrovsky Institute of Physical Chemistry, Czech Republic*

Štefan Vajda completed his studies of physical chemistry at the Faculty of Science of Charles University in 1985, where he also earned his PhD degree in chemistry in 1990. In 2003, he habilitated in experimental physics at the Freie Universität Berlin. He worked as a researcher at the Faculty of Science of Charles University (1989-1994) and at the Faculty of Mathematics and Physics of Charles University (1994-1995). While at the Faculty of Science, he spent a year at the University of Chicago as a Fulbright Scholar.

Štefan Vajda worked at the Institute of Physics of Freie Universität Berlin as a researcher and C1 assistant from 1995-2002, then moved to Argonne National Laboratory US, where he led a team of experimentalists focusing on the studies of catalytic properties of subnanometer clusters and small nanoparticles until 2018. In 2018, Štefan Vajda was on a detail assignment from Argonne National Laboratory to the US Department of Energy, Basic Energy Sciences, co-managing the university grant portfolio of the Separation Science Program of the Chemical Sciences, Geosciences and Biosciences Division of Basic Energy Sciences. After returning to Prague in 2019, he established the Department of Nanocatalysis at the J. Heyrovský Institute of Physical Chemistry. Since 2019, he has served as the head of the Department and also holds the position of the J. Heyrovský ERA Chair within the ERA Chair project funded by the European Commission. His research focus is on the identification and understanding of the function of new catalysts in various processes, including those relevant for industry or protection of the environment.

