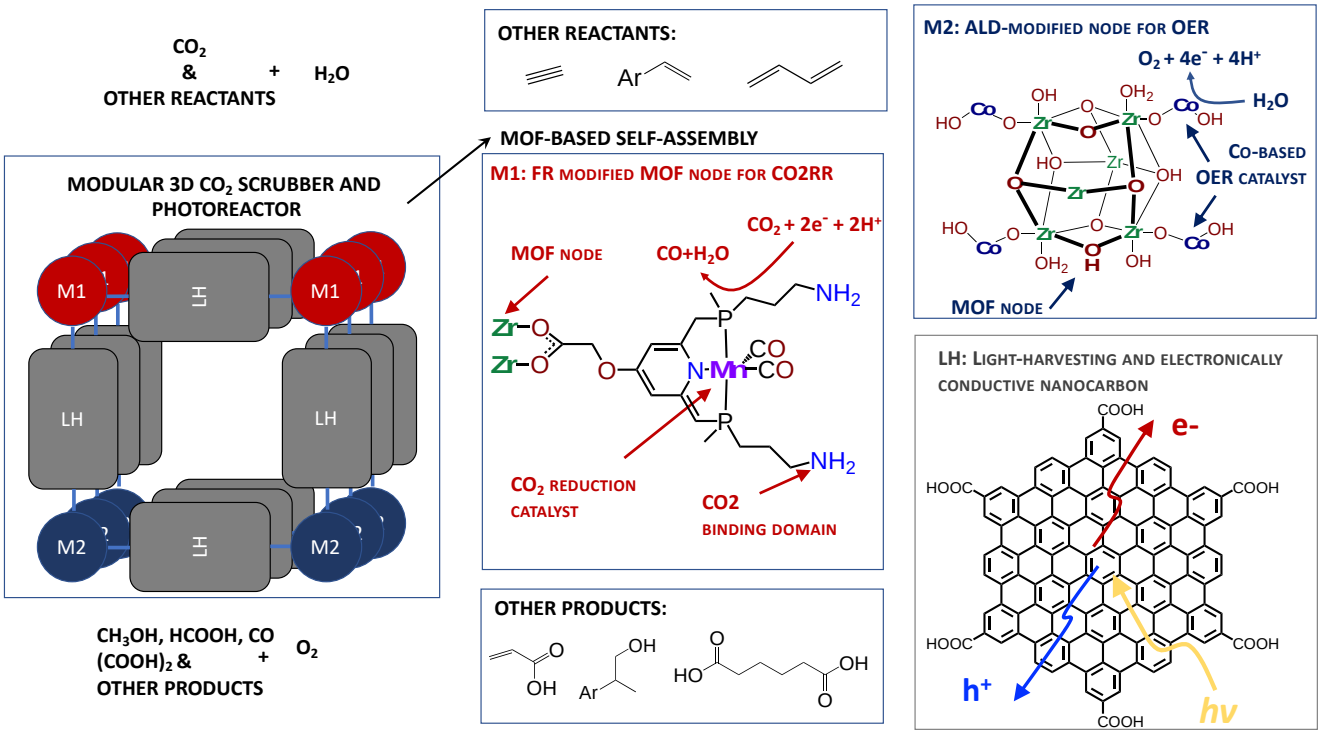
Biosketch: Ksenia Glusac received her academic training from the following institutions:
B.S. from University of Belgrade, Serbia (1999; Mentor: Prof. Radomir Saicic; Thesis: Syntheses of Model Taxol Derivatives);
Ph.D. from University of Florida, USA (2004; Mentor: Prof. Kirk S. Schanze; Thesis: Delocalization and Migration of Triplet States in Pt-acetylide Oligomers);
Postdoctoral training from Stanford University, USA (2006; Mentor: Prof. Michael D. Fayer; Topic: Electron Transfer Dynamics in Restricted Media Using Ultrafast Spectroscopy).
Ksenia started her independent research career at Bowling Green State University in 2006, where she was also a member of the Center for Photochemical Sciences, where she was promoted to the Associate level in 2012. In 2017, she took a position as the Associate Professor at the University of Illinois at Chicago, with a joint appointment at the Argonne National Laboratory. Ksenia was promoted to Professor in 2021. The Glusac group studies molecular motifs relevant to the energy storage and solar fuel applications. These projects are funded by NSF and DOE. Ksenia's research has been acknowledged by the following awards: (i) BGSU Outstanding Young Scholar Award, 2012; (ii) NSF CAREER Award, 2011-2016; (iii) ACS PRF Postdoctoral Fellowship, 2004-2006; (iv) Jones Award for Creativity and Originality, 2002.

Seminar Title: From captured CO_2 to value-added chemicals: a photochemical approach

Carbon dioxide is an abundant and inexpensive reagent that, if captured from the air, can serve as a source of value-added chemicals. However, efficient approaches toward direct-air capture of CO_2 rely on the formation of strong chemical bonds with the capturing reagent, which require prohibitively large energy inputs when CO_2 release is needed, rendering the overall capture process impractical. To circumvent this challenge, we investigate a photoreactive capture approach that combines the DAC of CO_2 with its direct conversion into value-added chemicals, such as formate or carbon monoxide, using visible light as an energy input. Light-responsive MOFs are explored as scaffolds for photochemical upgrading of CO_2, while transition metal complexes with pendant groups are investigated for reductive CO_2 capture.



Here, we report our recent findings on photo-reductive CO_2 capture that include: (i) the discovery of light-responsive nanographene MOFs whose bandgaps can be tuned throughout UV/Vis/near-IR ranges using a simple post-synthetic oxidation reaction; (ii) the discovery of reactive CO2 capture via CO2 insertion into Zr-OH bond, Ru-H bond or via reaction of CO2 with alkoxide ions from the secondary coordination sphere. These studies have provided us with novel chemical approaches that combine capture and conversion of CO_2.