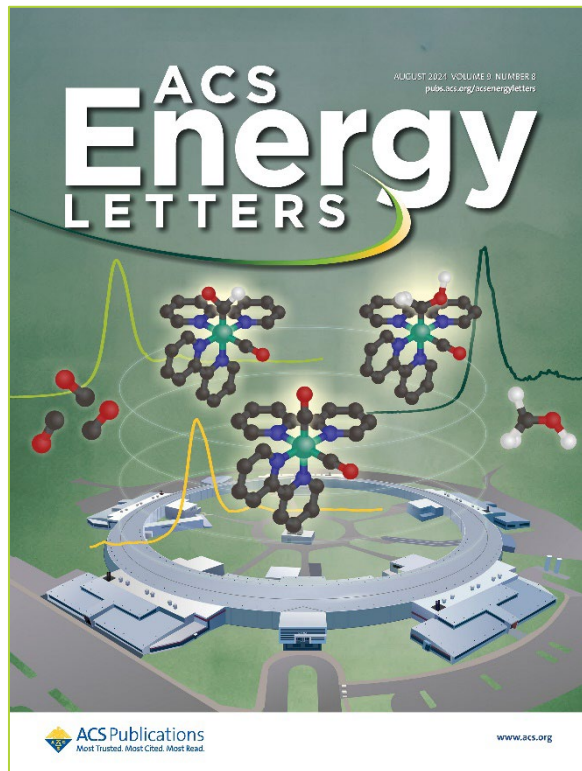


Renewable Catalysts for the Reduction of CO to Methanol

7-ID-1
SST1

8-BM
TES

8-ID
ISS



X-ray absorption spectroscopy at NSLS-II was used to study the evolution of Ru complexes during the catalytic reduction of CO to methanol.

I. Barba-Nieto, A.V. Müller, C.J. Titus, D. Wierzbicki, C. Jaye, M.Z. Ertem, G.J. Meyer, J.J. Concepcion, J. Rodriguez. *ACS Energy Lett.* **9**, 3815-3817 (2024).

Work was performed in part at NSLS-II

Scientific Achievement

The reduction of carbon monoxide (CO) to methanol was achieved using renewable organic hydride donors, ruthenium complexes, and visible light.

Significance and Impact

Developing solar-driven catalysts that can convert greenhouse gasses such as CO and CO₂ into liquid fuels will benefit the environment and boost the economy.

Research Details

- X-ray absorption spectroscopy was performed at NSLS-II beamlines ISS, TES, and SST-1.
- Each step of the CO reduction reaction was studied separately.
- By studying the Ru(II) metal center and ligand absorption edges, the oxidation state of the Ru(II) was determined at each step.

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