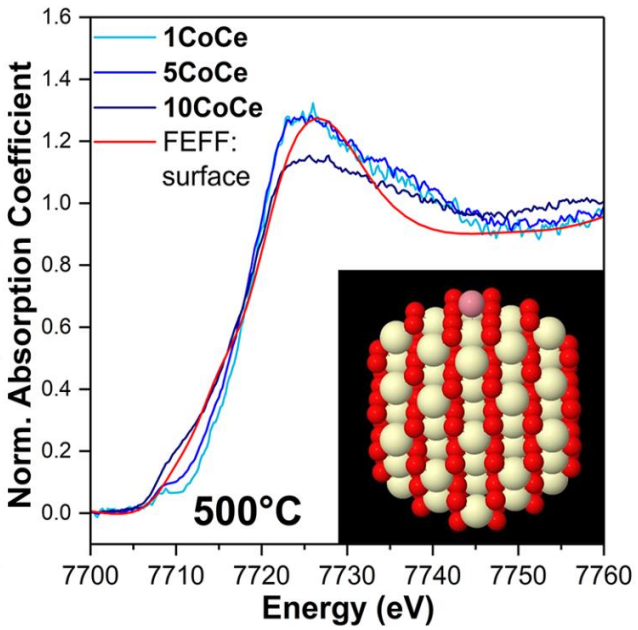
Mesoporous Co/CeO_2 Catalysts for Hydrogen Production



Co K-edge XANES and FEFF 9 models of Co atom on top of CeO_2 particle. Multiple techniques were used to investigate the crystalline structure, electronic properties, surface chemistry and reactivity of mesoporous Co/CeO_2 catalysts for hydrogen production.

Scientific Achievement

Scientists characterized mesoporous Co/CeO_2 catalysts and found the catalysts to be active for water-gas shift reactions at 300 – 500 ˚C.

Significance and Impact

The strong interactions seen between mesoporous CeO_2 and Co may aid in the development of new and inexpensive catalysts through multimodal material design.

Research Details

- Imaging, scattering, and spectroscopic techniques were used to study the details of the chemical reaction and catalysts under various temperatures.
- The active state of Co or Co oxide on the surface of ceria evolves through complex transformations as H_2 was optimally produced.

D. Vovchok, C Guild, S. Dissanayake, J. Llorca, E. Stavitski, Z. Liu, R. Palomino, I. Waluyo, Y. Li, A. Frenkel, J. Rodriguez, S. Suib, S. Senanayake, *J. Phys. Chem. C* 122, 8998−9008 (2018).

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