

Development of model catalysts and understanding their structure-property relationship

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Hajime Hojo is an associate professor of the Department of Advanced Materials and Engineering, Kyushu University, Japan. He received his PhD from Department of Material Chemistry, Kyoto University, and continued his research as JSPS Postdoctoral Fellow in Prof. Ikuhama's group of the University of Tokyo during 2008 and 2010. Then, he joined the STEM group of Oak Ridge National Laboratory during 2010 and 2011. After that, he worked as an assistant professor in Materials and Structures Laboratory, Tokyo Institute of Technology. From Oct. 2016, he joined Kyushu University as an associate Professor. His research interest lies in elucidating the structure-property relationship of novel functional materials such as strongly correlated electron systems and oxide catalysts, using aberration-corrected scanning transmission electron microscope.

Abstract

Oxides such as CeO_2 , TiO_2 , and various perovskite-type oxides are known to act as catalysts that promote various chemical reactions, either on their own or when supported with (noble) metals. Since the catalytic activity of these oxides is often significantly influenced by the reactivity of their lattice oxygen, obtaining guidelines for controlling the reactivity of lattice oxygen is an important issue not only from an academic perspective but also from an applied perspective. However, the identification of control parameters for tuning the reactivity of lattice oxygens is not simple because many factors can affect the reactivity of lattice oxygen such as the lattice plane and lattice distortion. Herein, we have developed three kinds of model catalysts (sintered-body based model catalysts, shape-controlled nanoparticles, and epitaxial-film-based model catalysts) to finely tune the lattice plane and lattice distortion and studied the structure-property relationship using aberration-corrected scanning transmission electron microscope and first-principles calculations [1-4].

References

1. **H. Hojo**, M. Gondo, S. Yoshizaki, H. Einaga, *Nano Lett.* 2022, 22, 145.
2. **H. Hojo**, M. Nakashima, S. Yoshizaki, H. Einaga, *ACS Nano* 2024, 18, 4775.
3. **H. Hojo**, K. Hirota, S. Ito, H. Einaga, *Adv. Mater. Interfaces* 2023, 10, 2201954.
4. R. Suzuki, **H. Hojo**, H. Einaga, *submitted*.

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