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**Yanjun Li**

Osaka University, Japan

Local dipole moment on rutile TiO₂(110) surface by electrostatic force microscopy

Au/TiO₂(110) surfaces display extremely high catalytic reactivity. There are many representative models that explain the emerging catalytic activity of Au nanoclusters. It is widely accepted that the perimeter interface of Au/TiO₂ is the reaction site for CO oxidation. However, the injection/extraction mechanism of electrons and the reaction process are not clarified by a comprehensive experimental description. In this study, we proposed a new method to simultaneously measuring topography, local contact potential difference (LCPD) and dipole moment distribution on TiO₂(110) surface. In the experiment, the DC bias added with ac bias voltage is applied between the tip and sample. Three lock-in amplifiers are used to detect frequency shift of ω , 2ω and 3ω . The contact potential difference is numerically calculated from the divided result of ω and 2ω signals and dipole moment is obtained from frequency shift of 3ω . The simultaneously measurement result of topography, LCPD and dipole moment images were obtained on TiO₂(110) surface. The details will be reported in the meeting.

Biography

Y J Li has completed her PhD from the University of Tsukuba, Japan during 1998-2001. From 2001-2003, she was a Research Fellow at Institute for Molecular Science, Okazaki, National Research Institutes, Japan. From 2004-2009, she worked as Visiting Associate Professor at Osaka University, Japan and from 2010-present, as an Associate Professor at Osaka University, Japan. She has published more than 70 papers in reputed journals.

liyanjun@ap.eng.osaka-u.ac.jp**Notes:**