

Abstract Submitted
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Investigation of Local Structures and Magnetism in (Y, Co) codoped CeO₂ Nanoparticles¹ T.S. WU, H.D. LI, Y.W. CHEN, S.F. CHEN, Department of Physics, National Tsing Hua University, Taiwan, S.L. CHANG, National Synchrotron Radiation Research Center, Taiwan, Y.L. SOO, Department of Physics, National Tsing Hua University, Taiwan — Nanocrystals of (Y, Co) codoped CeO₂ with different Y concentration prepared by a Polyol method were studied by X-ray diffraction (XRD), high-resolution transmission electron microscopy (HR-TEM), Raman spectroscopy, x-ray absorption fine structures (XAFS), and superconducting quantum interference device (SQUID) techniques to monitor the structural and magnetic variations of the samples. As revealed by the XRD data, all nanocrystal samples under investigation have similar average particle size. The concentration of O vacancies in the samples was found to increase with Y doping level as indicated by the Raman spectroscopy and XAFS data. Such increase of O vacancies is also accompanied by enhanced ferromagnetism as observed by SQUID measurements. Our experimental results demonstrate clear correlation between magnetism and O vacancies induced by Y doping and therefore are consistent with the bound magnetic polaron model.

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