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▶ **To cite this version:**

M.I. Richard, M. Dupraz, C. Chatelier, C. Atlan, E. Bellec, et al.. Structural evolution of nanoparticles under realistic conditions observed with Bragg coherent X-ray imaging. Acta Crystallographica Section A : Foundations and Advances [2014-..], 2022, 78 (a2), pp.e94-e94. 10.1107/S2053273322095869 . cea-04066378

HAL Id: cea-04066378

https://cea.hal.science/cea-04066378v1

Submitted on 28 Aug 2023

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MS14 Materials for energy storage and Conversion

MS14-01

Structural evolution of nanoparticles under realistic conditions observed with Bragg coherent X-ray imaging

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Abstract

The advent of the world's first coherent hard X-ray sources represents an unprecedented opportunity to conduct in situ and operando studies on the structure of nanoparticles in reactive liquid or gas environments in synchrotrons. In this talk, I will illustrate how Bragg coherent X-ray imaging [1] allows to image in three dimensions (3D) and at the nanoscale the strain and defect dynamics inside nanoparticles as well as their refaceting during catalytic reactions [2–5]. I will also highlight the potential of machine learning to predict characteristic structural features in nanocrystals just from their 3D Bragg coherent diffraction patterns [6].

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