Investigating Processes of Nanocrystal Formation and Transformation via Liquid Cell TEM - DTU Orbit (27/03/2019)

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Recent ex situ observations of crystallization in both natural and synthetic systems indicate that the classical models of nucleation and growth are inaccurate. However, in situ observations that can provide direct evidence for alternative models have been lacking due to the limited temporal and spatial resolution of experimental techniques that can observe dynamic processes in a bulk solution. Here we report results from liquid cell transmission electron microscopy studies of nucleation and growth of Au, CaCO3, and iron oxide nanoparticles. We show how these in situ data can be used to obtain direct evidence for the mechanisms underlying nanoparticle crystallization as well as dynamic information that provide constraints on important energetic parameters not available through ex situ methods.

**General information**

State: Published
Organisations: Department of Physics, Experimental Surface and Nanomaterials Physics, Pacific Northwest National Laboratory, Ecole Normale Superieure, University of Konstanz, Lawrence Livermore National Laboratory, Lawrence Berkeley National Laboratory, University of California at Berkeley
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Number of pages: 12
Pages: 425-436
Publication date: 2014
Peer-reviewed: Yes

**Publication information**

Journal: Microscopy and Microanalysis
Volume: 20
Issue number: 2
ISSN (Print): 1431-9276
Ratings:
- BFI (2019): BFI-level 1
- Web of Science (2019): Indexed yes
- BFI (2018): BFI-level 1
- Web of Science (2018): Indexed yes
- BFI (2017): BFI-level 1
- Scopus rating (2017): CiteScore 0.49 SJR 0.292 SNIP 0.275
- Web of Science (2017): Impact factor 2.124
- Web of Science (2017): Indexed yes
- BFI (2016): BFI-level 1
- Scopus rating (2016): CiteScore 0.5 SJR 0.31 SNIP 0.279
- Web of Science (2016): Impact factor 1.891
- Web of Science (2016): Indexed yes
- BFI (2015): BFI-level 1
- Scopus rating (2015): CiteScore 0.57 SJR 0.311 SNIP 0.195
- Web of Science (2015): Impact factor 1.73
- BFI (2014): BFI-level 1
- Scopus rating (2014): CiteScore 1.41 SJR 0.301 SNIP 0.46
- Web of Science (2014): Impact factor 1.872
- Web of Science (2014): Indexed yes
- BFI (2013): BFI-level 1
- Scopus rating (2013): CiteScore 1.55 SJR 0.286 SNIP 0.279
- Web of Science (2013): Impact factor 2.161
- ISI indexed (2013): ISI indexed yes
- Web of Science (2013): Indexed yes
- BFI (2012): BFI-level 1
- Scopus rating (2012): CiteScore 0.52 SJR 0.327 SNIP 0.408
- Web of Science (2012): Impact factor 2.495
- ISI indexed (2012): ISI indexed yes
- Web of Science (2012): Indexed yes