

Sample Results Summary Sheet

Please return this form to the Curator for each allocated Sample

Sample ID: RA-QD02-0050

PI: Takaaki Noguchi

Type and date of analysis performed:

Potted butt: Scanning electron microscopy (SEM) at Ibaraki University on Feb. 7, 2011.

Ultrathin sections: Scanning transmission electron microscopy (STEM) at Hitachi

High-technologies Co., on Feb. 9 and Nov. 17, 2011

FIB sections: TEM at Ibaraki University on Feb. 20 and 22.

Elements or phases identified: (Mg, Si, olivine, pyroxene, aromatic carbon, etc.)

Olivine, high-Ca pyroxene, plagioclase, troilite

Nano particles were not observed on the surface of olivine in ultrathin sections.

A very thin (~2 nm) surface layer was observed on olivine, which is enriched in Si and contains Na, Al, K, and Ca as well as Mg and Fe.

Contaminant phases identified: (Al, SUS, carbon particles, etc.)

Not identified.

Sample handling: (e.g. exposed in atmosphere, embedded in resin, polished, sliced by FIB or UMT)

Embedding in epoxy resin in atmosphere at Ibaraki University on Feb.2, 2011 (Because this sample has been already enclosed in a thin layer of epoxy resin at the curation facility during preparation for the mainstream analyses, this sample was not exposed directly to the earth's atmosphere.)

Ultramicrotomy at Ibaraki University in atmosphere on Feb. 6, 2011. The ultrathin sections on TEM grids were preserved in a vacuum desiccator just after ultramicrotomy.

Carbon coating of the potted butt at Ibaraki University on Feb. 7, 2011. The potted butt was preserved in a vacuum desiccator just after carbon coating.

After SEM observation, FIB sections were lifted out from the potted butt on Feb. 9 and 10, 2011.

Then, the remainder potted butt was kept in a vacuum desiccator.

State of sample pre-analysis: (e.g. N₂ hold, atmosphere, resin embedded, polished section, UTS) (please describe treatments and/or modifications for the sample you have done before

your analysis)

STEM observation: ultramicrotomed sections embedded in epoxy resin.

SEM observation: Carbon coated potted butt.

State of sample post-analysis:

All the ultrathin sections and the remainder of the potted butt were preserved in a vacuum desiccator at Ibaraki University.

Analysis data Notes: (summary of the attached analysis data and/or images)

Please see the summary seat of this particle.

Sample handling history

1. Embedding in epoxy resin at Ibaraki Univ. on Feb.2, 2011
2. Ultramicrotomy at Ibaraki Univ. on Feb. 6, 2011
3. Potted butt: Carbon coating at Ibaraki Univ. on Feb. 7, 2011
4. Potted butt: SEM at Ibaraki Univ. on Feb. 7, 2011
5. Ultrathin sections: STEM at Hitachi High-tech., on Feb. 9, and Nov. 17, 2011
6. Potted butt: FIB at Hitachi High-tech., on Feb. 9 and 10, 2011 (2 samples were prepared)
7. FIB samples: TEM at Ibaraki Univ. on Feb. 20 and 22, 2011

Processes 1 to 3 were performed in atmosphere.

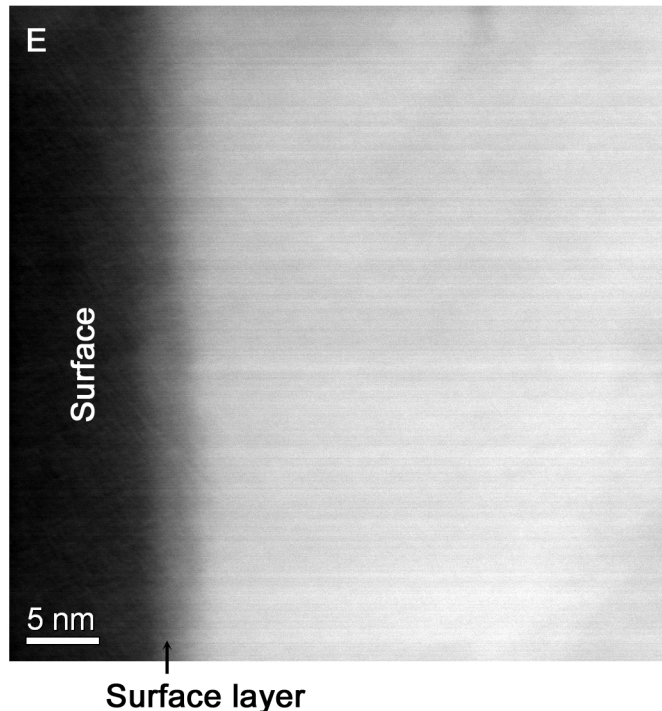
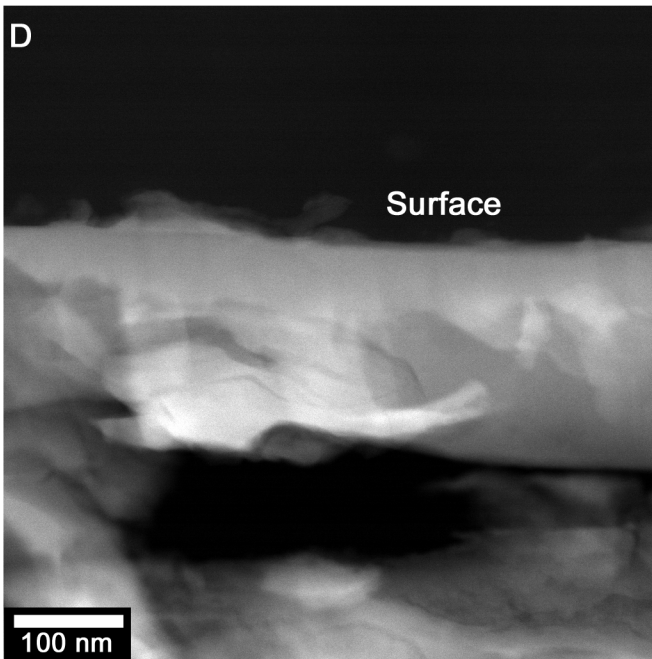
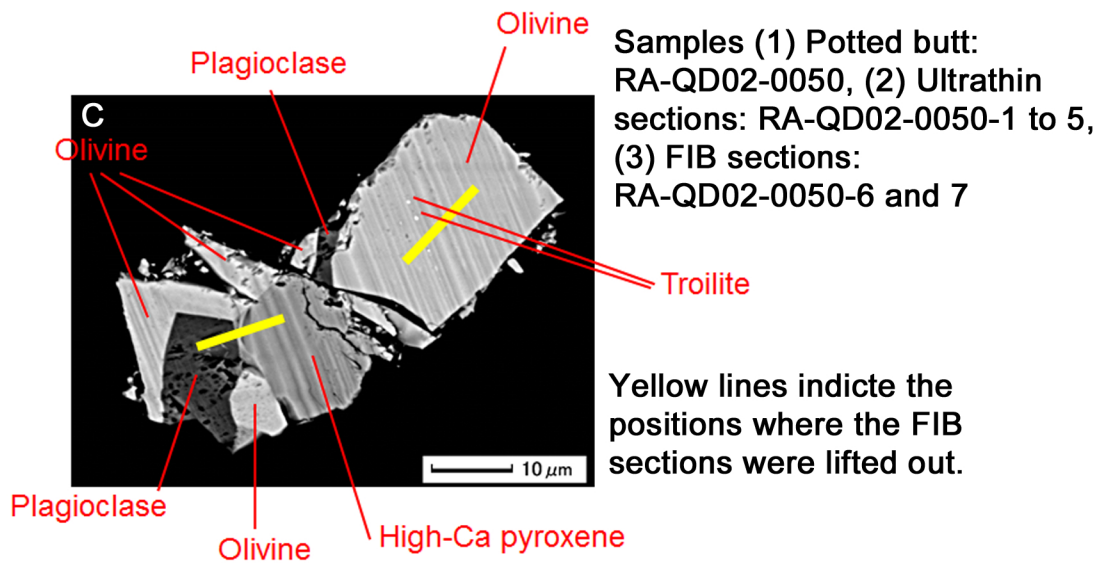
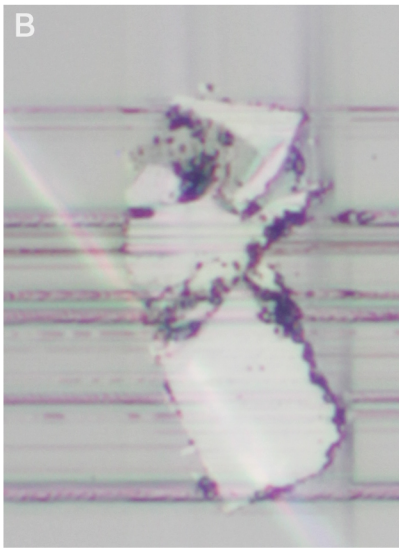
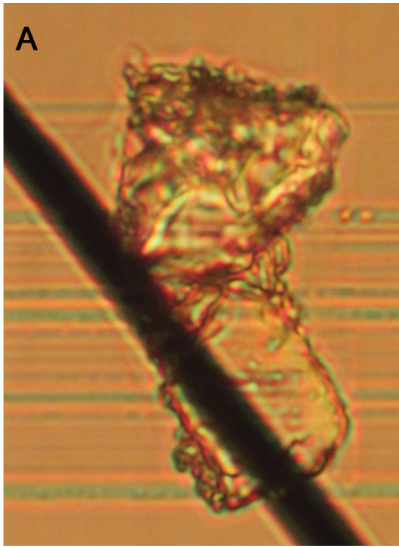


Figure caption A and B) Potted butt: Optical photomicrographs after UM (open and reflected) (2). C) BSE image of PB (4). Striations are artifacts formed during ultramicrotomy. D and E) HAADF-STEM images of the surfaces of olivine in RA-QD02-0050-1 (5). D) There is no nanoparticle-bearing rim on this Itokawa dust particle. E) An edge-on image of the surface. This image shows a quite thin (~2 nm thick) surface layer on olivine. The layer is enriched in Si and contains Na, Al, K, and Ca as well as Mg and Fe.