Sample Results Summary Sheet

Please return this form to the Curator for each allocated Sample

Sample ID: RA-QD02-0035 (One among the four original samples for space weathering observation)

PI: Takaaki Noguchi

Type and date of analysis performed:

Potted butt: Field emission scanning electron microscopy (FE-SEM) at Hitachi High-technologies Co. on Feb. 3, 2011. The potted but was observed without carbon coating.

Ultrathin sections: Scanning transmission electron microscopy (STEM) at Hitachi High-technologies Co., on Feb. 3, 2011.

Potted butt: Scanning electron microscopy (SEM) at Ibaraki University on Feb. 16, 2011.

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

Olivine, plagioclase, and troilite.

Nano particles were observed on the surface of olivine in ultrathin sections.

Nano particles on the surface contain sulfur.

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

Not observed.

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

Embedding in epoxy resin in N_2 purge environment at the curation facility, ISAS/JAXA on Jan. 18, 2011.

Transportation by using a N_2 purge box from ISAS/JAXA to Ibaraki University on Jan. 21, 2011.

Ultramicrotomy at Ibaraki University in an N_2 purge glove box on Feb. 1, 2011. The ultrathin sections on TEM grids were preserved in an N_2 purge glove box. Ultrathin sections on TEM grids and a potted but were in an aluminum-coated plastic bag and the bag was sealed thermally.

Carbon coating of the potted butt at Ibaraki University on Feb. 15, 2011. The potted butt was preserved in a vacuum desiccator just after carbon coating.

After SEM observation, the potted butt was embedded again for further main stream analyses on Feb. 17, 2011. Then, it was polished manually during February. It was transferred to Kyushu

University and then Hokkaido University. It was returned to Ibaraki University on Jul. 6, 2011. It 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.

FE-SEM observation: Without carbon coating.

SEM observation: Carbon coated potted butt.

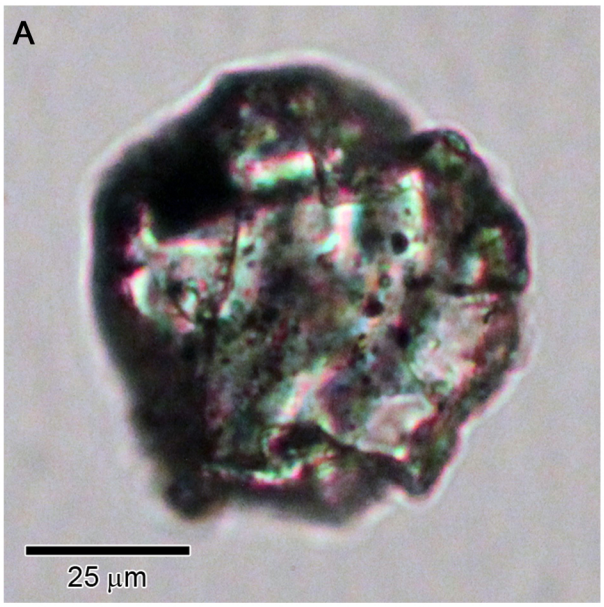
State of sample post-analysis:

All the ultrathin sections were preserved in an aluminum-coated plastic bag, in which N_2 gas is filled at Ibaraki University.

The potted butt was preserved in a vacuum desiccator at Ibaraki University.

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

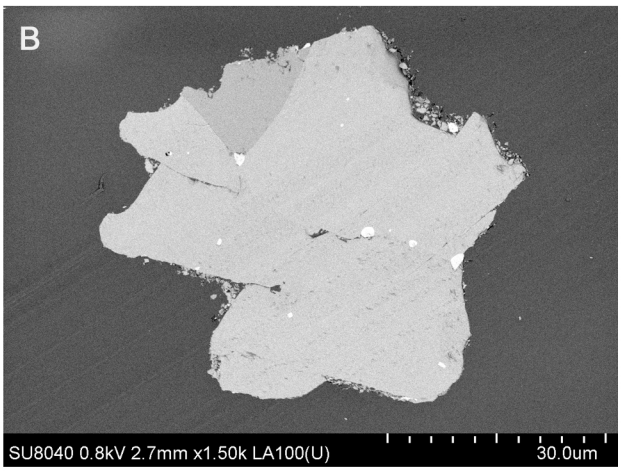
Please see the summary seat of this particle.

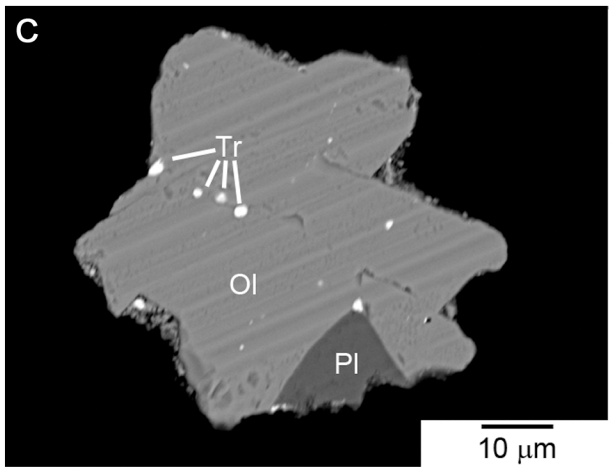


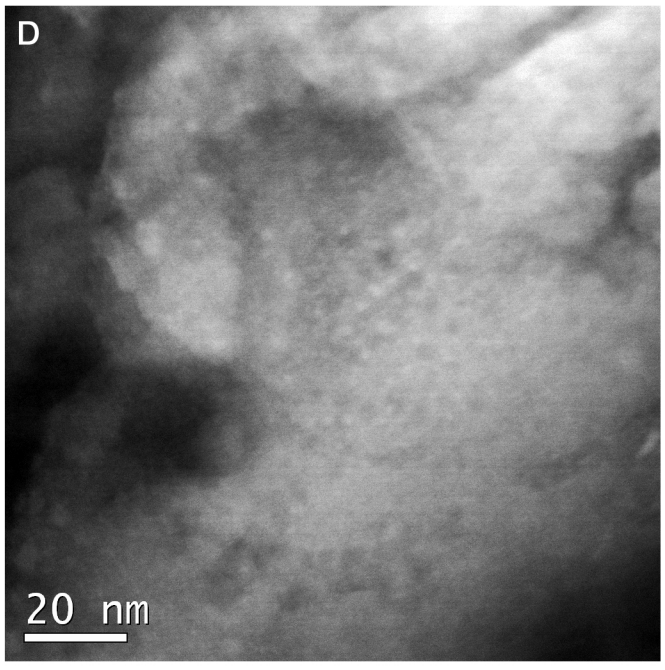
Sample handling history
1. Embedding in epoxy resin at ISAS/JAXA on Jan.18, 2011
2. Transport by using N_2 purge box on Jan. 21, 2011
3. Ultramicrotomy at Ibaraki Univ. on Feb. 1, 2011
4. Potted butt: FE-SEM at Hitachi High-tech., on Feb. 3, 2011 (without carbon coating)
5. Ultrathin sections: FE-STEM at Hitachi High-tech., on Feb. 3, 2011
6. Carbon coating of PB at Ibaraki Univ. on Feb. 15, 2011
7. Potted butt: SEM at Ibaraki Univ. on Feb. 16, 2011
8. Re-embedding of PB at Ibaraki Univ. on Feb. 17, 2011
9. Manual polishing at Ibaraki Univ. during Feb.

Processe No. 8 was performed in the earth's atmosphere, processes No. 1 to 3 were performed in N_2 atmosphere (<0.1% O_2, <-50 °C DT).

Samples (1) Potted butt: RA-QD02-0035, (2) Ultrathin sections: RA-QD02-0035-1 to 3
Except for a few sections on RA-QD02-0035-2, all the other sections were lost during STEM observation.due to explosive evapolation of ethylene glycol during STEM observation.







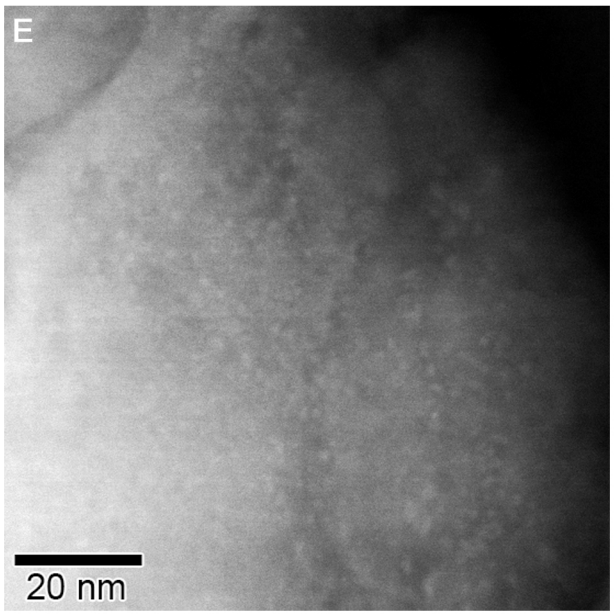


Figure A) An optical image before UM (3). B) BSE image of PB (4). Abbribiations; Ol: olivine, Pl: plagioclase, Tr: troilite. Striations are artifacts formed during ultramicrotomy. C) BSE image of PB (7). D and E) HAADF-STEM images of surfaces of olivine (5).