

U005-15

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Initial analysis of the Hayabusa recovery materials: Petrographical characterization

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Characterization of the structural, textural and petrographical features of terrestrial and extraterrestrial materials is a fundamental and crucial approach to understanding natural physical phenomena. In particular, understanding the relationship between texture and chemical compositions of the constituent phases in lithic fragments and particles is of considerable importance as it quickly provides the first-order information necessary to assess their origin and evolutionary history.

In preparation for the initial petrographical characterization of the Hayabusa recovery materials, an analytical protocol for studying particle samples has been developed at ISEI (Kobayashi et al., this meeting) and has been repeatedly tested and rehearsed. We are now ready to apply our knowledge of geology, petrology and geochemistry to the study of the Hayabusa recovery materials.

In our petrographical characterization, we will (1) determine optical properties of the individual grains, (2) use FE-SEM observation and semi-quantitative analyses to identify constituent phases and to characterize their surface texture, (3) carry out FIB milling of grains investigated in step (2), (4) determine the major element composition and elemental distribution of FIB-milled micro-slices in step (3) by FE-SEM (equipped with EDS, WDS, and CL) and EPMA, and (5) perform ATEM study of FIB-milled foil in step (3). These data will then be used to decide analytical points for in-situ trace element and isotope analyses by HR-SIMS (Kunihiro et al., this meeting).

In this presentation, we will report some results from our micro petrographic study of meteorite particles. We also hope to show some petrographic characteristics of particles from Asteroid Itokawa.

Keywords: Hayabusa, MUSES-C, Asteroid Itokawa, initial analysis