

CURATION OF THE HAYABUSA-RETURNED SAMPLES IN THE JAXA EXTRATERRESTRIAL SAMPLE CURATION CENTER.

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Introduction: The Hayabusa spacecraft accomplished touchdowns onto a S-type asteroid Itokawa twice and returned its reentry capsule to the Earth in June 2010 [1]. After it was recovered in the Australian desert and sent back to Japan, it was treated in clean rooms of the extraterrestrial sample curation center (ESCUC) of JAXA and finally returned samples were recovered from the sample catcher, as described in [2]. Here, I review initial description for the samples, their distributions, and schedules for sample recovery.

Samples recovery and initial descriptions: The sample catcher of Hayabusa is composed of room A and B, and a rotational cylinder. Room A should retain samples obtained from the second touchdown onto the asteroid, and room B from the first one. In the clean chamber filled with purified N₂, quartz glass disks were attached to the openings of both room A and B, and the catcher was tapped so that particles in it should be fallen onto the quartz disks. Then those recovered on the disks were handpicked one by one with an electrostatically controlled micro-manipulator and analyzed by SEM-EDS for their qualitative chemical compositions. The handpicking have been also performed for a cover of the room B. They are grouped into four categories based on their constituent minerals. They are numbered for their own IDs to be stored on gridded quartz glass slides, which are preserved in the chamber of N₂ environment.

Present status of recovered samples and their distributions: So far, particles initially described reaches more than 400, and around 80% of them are mostly composed of silicate minerals, which are thought to be asteroid Itokawa origin. Some of them had been distributed to preliminary examinations, which have been already reported elsewhere [3-10]. Based on memorandum of understanding (MOU) between JAXA and NASA, some of them have been distributed to JSC/NASA. JAXA started international announcement of opportunity (AO) of the Hayabusa-returned samples in 2012, and the sample distributions for 2nd AO researchers are ongoing now.

Future schedule: Understanding of whole the recovered samples is so essential to the curation work of Hayabusa, although not all of them have been recovered yet so far. This fiscal year, we will try sample recovery from the rotational cylinder of the catcher, which is a new part of the catcher, other than the room A and B. Then we will perform thorough sample recovery from the catcher, which will end up to decompose the catcher in the next fiscal years. Samples from these fractions will be open for international AO in the next several years.

References: [1] Abe M. et al. (2011) *LPS XLII*: #1638. [2] Yada T. et al. (2013) *MAPS*, *in press*. [3] Nakamura T. et al. (2011) *Science* 333: 1113. [4] Yurimoto Y. et al. (2011) *Science* 333: 1116. [5] Ebihara M. et al. (2011) *Science* 333: 1119. [6] Noguchi T. et al. (2011) *Science* 333: 1121. [7] Tsuchiyama A. et al. (2011) *Science* 333: 1125. [8] Nagao K. et al. (2011) *Science* 333: 1128. [9] Naraoka H. et al. (2013) *Geochem. J.*: 46, 61. [10] Nakamura E. et al. (2012) *PNAS* 109: E624.