Present status of both curation of Hayabusa-returned samples and preparation for reception of Hayabusa2 returned samples.

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Introduction: JAXA has curated samples returned from asteroid since 2010, when Hayabusa spacecraft returned regolith particles of S-type near Earth asteroid 25143 Itokawa [1, 2]. The sample curation of Hayabusa returned samples has been still going on at present, and the preparation for sample reception of returned samples by Hayabusa2, which will reach its target C-type asteroid 162173 Ryugu in 2018 and return its recovered samples in 2020 [3]. Here we update both situations.

Present status of curation of Hayabusa-returned samples: Astromaterials Science Research Group (ASRG) in JAXA has continued initial description of Hayabusa-returned samples at Extraterrestrial Sample Curation Center (ESCuC). So far, almost 730 particles have been described by FE-SEM/EDS, and more than 80% of particles are mainly composed of silicate, considered to be Itokawa origins. All of the initial description data are published for world-wide researchers on the ASRG web site (http://hayabusaao.isas.jaxa.jp/curation/hayabusa/index.html), and some fractions of them are distributed to researchers for further investigation as international announcement of opportunity (AO), which have been done four times until now. The latest international AO was the 4th one ended at the end of Nov. 2016, in which eight proposals were selected for sample allocation and 36 Hayabusa-returned particles have been distributed to the principle investigators of them. Some important results of the international AO have been already published, such as visible-IR spectra analyses on Itokawa particles for comparison with those of asteroid Itokawa [4], Ar-Ar dating for Itokawa particles for estimating 1.4Ga impact age [5], and detail surface observations of Itokawa particles to reveal dynamic features of regolith movements on the surface of small bodies [6]. The new international AO will start in the first half of this year. Other than the previous AOs, it does not have its submission due of proposals and will continue as far as numbers of rest particles would reach the limitation of distribution.

Establishment of the curation facility for Hayabusa2-returned samples: As mentioned previously, Hayabusa2 will returned the samples recovered from the target asteroid Ryugu to the Earth in Dec. 2020. Because its target body is C-type asteroid, we must take care of contaminations from terrestrial water, atmosphere, and organics. Thus, the returned samples container will be opened in vacuum, and some fraction of samples will be recovered and stored in the vacuum condition. After the partial sample recovery in vacuum, rest of them will be treated in ultrapure nitrogen condition, weighed and distributed for further investigation. The new establishing clean chamber system is composed of five chambers; two of them are for the former purpose, and rest of them are prepared for the latter purpose. At present, a new cleanroom for setting those chambers is under construction and will be established in this fall at the ESCuC. The former two chambers will be set in there until the end of this year. The latter three ones will be installed in the first half of 2018, and their functional checks and rehearsal for the reception of Hayabusa2-returned samples will start in the second half of 2018. In parallel, Hayabusa2 project is going to organize sub-PIs of the initial analyses team, which will be composed of representative researchers in related science fields. They will show up in this year, and discussion for initial analyses will begin very soon after the announcement.

Concluding remarks: In the summer of 2018, a small C-type asteroid Ryugu will be unveiled by Hayabusa2 with its onboard remote-sensing instruments. And the first samples returned from C-type asteroid will be hopefully available in 2020.

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