INQUIRY ABOUT THE PRESENCE OF AQUEOUS ALTERATION PRODUCTS ON THE ITOKAWA SURFACE: PROPOSITION OF NEW CONSORTIUM STUDIES.

A. Nakato[1], M. Uesugi[1], Y. Karouji[1], T. Yada[1], M. Hashiguchi[1], T. Matsumoto[1], K. Kumagai[1], M. Nishimura[1], T. Okada[1], and M. Abe[1], [1]ISAS/JAXA, Email: nakato@planeta.sci.isas.jaxa.jp

Introduction: Hayabusa samples have been catalogued at the Extraterrestrial Sample Curation Center (ESCuC) of JAXA [1], and some of them have been allocated to the preliminary examinations, international AOs, and NASA. However, some particles are not allocated to the international AOs because of their rare characteristics. These rare particles are under investigations as the consortium studies lead by the member of ESCuC [2-4]. In this paper, we propose three particles bearing Fe-S-Ni phase and Ca-Mg-Na phase, as new consortium studies. Since no other Itokawa sample contains the phases, these particles that may indicate a new variety of Itokawa surface materials are rare and valuable. We present the particles' overview and research ideas. To maximize scientific gain [5], we widely call for the proposal.

A particles including Fe-S-Ni phase: RB-QD04-0040 is mainly consists of olivine (74 μm) with tiny Fe-S-Ni phase (<3 μm). Our motivation of this consortium study is to identify mineralogy of the Fe-S-Ni phase. After determination of internal structure obtained by XCT, the phase is characterized by XRD. STEM observation will be performed for the detail observation, especially the coexisting minerals. If this phase was the pentlandite single crystal, it can be the first discovery of the aqueous alteration product from the Hayabusa samples.

Particles including Ca-Mg-Na phase: Both RA-QD02-0210 and RA-QD02-0228 (about 30 μm) are particles containing Ca-Mg-Na phase (3-5μm). To identify the phase, SEM, XCT, and XRD will be performed. In the case that the phase is extraterrestrial carbonate, it might be formed by aqueous alteration. If the phase was the organic matter, detailed characterization is required. Although 44 particles that mainly consist of carbon have already been reported, previous study [6] suggests that the origin may be terrestrial contamination.

Presence of pentlandite and carbonate indicates that carbonaceous chondrite-like material distributes on the Itokawa surface. It reflects that these minerals might be evidence of implantation from C-type asteroid to the S-type asteroid.

References: [1] Yada et al. 2015. *78th MetSoc, #5215*. [2] Uesugi et al., 2014. *76th MetSoc, #5226*. [3] Yada et al., 2013. *76th MetSoc, #5150.* [4] Karouji et al., 2014. *77th MetSoc, #5240*. [5] Abe et al., 2013. *76th MetSoc, #5147*. [6] Uesugi et al., 2014. *Earth, Planets. Space. 66:102.*