MICRO-RAMAN SPECTROSCOPY OF A PLAGIOCLASE SAMPLE FROM ASTEROID ITOKAWA.

A. Gucsik[1], H. Nishido[2], K. Ninagawa[3], A. Kereszturi[1], T. Nakamura[4] and A. Tsuchiyama[5]. [1]Konkoly Thege Miklos Astronomical Institute, Research Centre for Astronomy and Earth Sciences, Hungarian Academy of Sciences; [2]Department of Biosphere-Geosphere System Science, Okayama University of Science, 1-1 Ridai-cho, Okayama, 700-0005, Japan; [3]Department of Applied Physics, Okayama University of Science, 1-1 Ridai-cho, Okayama, 700-0005, Japan; [4]Department of Earth and Planetary Materials Science, Graduate School of Science, Tohoku University, Sendai 980-8578, Japan; [5]Kyoto University, Faculty of Science, Graduate School of Science, Division of Earth and Planetary Sciences, Kitashirakawaoiwake-cho, Sakyu-ku, Kyoto-shi, 606-8502, Japan

Introduction: We report a systematic spectroscopical investigation of a plagioclase particle (RA-QD02-0025-01) returned by the Hayabusa spacecraft from asteroid Itokawa by means of Micro-Raman Spectroscopy. The structural properties of that selected sample are used to evaluate the crystallization effects and shock wave history as well as the degree of space weathering processes of asteroid Itokawa.

Results and Discussion: Only one grain (RA-QD02-0025-01) was selected for the Raman analysis as it shows the best quality/crystallinity among three available specimens. Raman spectral properties obtained at 514 nm (University of Johannesburg, South Africa) excitation show two Raman vibrations at 476 and 505 cm^{-1}, which are superimposed at a relatively high background fluorescence. This indicates a highly distorted structure. In order to reduce the background fluorescence, Raman spectra were taken from two spectral regions such as 400-600 and 1100-1200 cm^{-1} using LabRam (Jena, Germany) facility at 638 nm excitation. Raman spectral properties exhibit three Raman bands centered at 476, 505 and 1009 cm^{-1}. According to McKeown [1], Raman peaks in albite at 476 cm^{-1} is related to the tetrahedral ring compression in ab-plane, at 505 cm^{-1} is assigned to compression of four-membered tetrahedral rings along c and a peak centered at 1009 cm^{-1} is associated with Si-tetrahedral base breathing. Shock pressure-induced amorphization such as occurrence of maskelynite and its Raman signatures were not observed in the selected grain (e.g., [2,3].

References: [1] McKeown A.D. et al. 2005. *American Mineralogist* 90: 1506-1517. [2] Fritz J. et al. 2005. *Antarctic. Met. Res.* 18: 96-116. [3] Tomioka N. et al. 2010. *Geophys Res Lett* 37: L21301.