[EJ] Evening Poster | P (Space and Planetary Sciences) | P-PS Planetary Sciences

[P-PS06]Formation and evolution of planetary materials in the Solar System

convener:Akira Yamaguchi(National Institute of Polar Research), Wataru Fujiya(Ibaraki University, College of Science), Yoko Kebukawa(横浜国立大学 大学院工学研究院, 共同), Masahiro KAYAMA(Department of Earth and Planetary Material Sciences, Faculty of Science, Tohoku University)
Wed. May 23, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)
This session will focus on the evolution in the Solar System with interaction and co-evolution in minerals, water, organic matter, and noble gas in meteorites and interplanetary dust particles. New innovative analytical and theoretical techniques in various fields will be discussed. The developing methods are welcome to submit for the future mainstream of meteorite study. In order to explore the planetary materials and their evolution, both meteorite studies and experimental approaches are necessary. In this session, we will discuss these topics from extraterrestrial sample analyses and experimental works. Research works on undifferentiated and differentiated meteorites and parent body processes such as aqueous alteration, thermal metamorphism, shock metamorphism, volcanic activity, and core-mantle-crust differentiation are especially included in this session.

[PPS06-P06]The Hachioji meteorite: Petrological and noble gas study and classification

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Keywords:meteorites, ordinary chondrites

The Hachioji meteorite fell in 29 December 1817 as a shower including ~1 m stones covering an area over 10 km in the western Tokyo. Although part of the recovered meteorites were sent to the Tokugawa Shogunate, all the stones had been lost to date. In 1950th, ~0.1 gram chip of the meteorite was found in classical documents (envelope) from "Tuchimikado". The chip was enclosed by a document on the Hachioji recovery. In the same envelope a paper describing about the Sone meteorite, fell in Kyoto in 1866, was included. Thus, a question arises whether the small chip was part of Hachoji. Since it was difficult to examine the small chip using analytical techniques in 50th, no detailed descriptions of this chip had been available. We performed a petrological and noble gas study of the "Hachioji" chip. Polished thick and thin sections (PTSs) are made from 20 mg chip and examined optically and with a scanning electron microscope and electron microprobe analyzer (EPMA). Coarse powders, 0.7 and 5.4 mg were used for X-ray diffraction (XRD) analysis and noble gas study respectively. The powder sample for noble gas analysis was embedded in resin and polished to investigate with EMPA. The sample was washed and recovered from the resin and used for noble gas analysis. We also performed the same analyses for the Sone meteorite for comparison. PTSs of Hachioji and Sone show moderately recrystallized textures with a few chondrules. Large FeNi metal nodules are observed. The shock stages of both the meteorites are S1. Olivine Fa in Hachioji range from 17.96-20.06, and those of Sone, 17.91-19.62. Pyroxene Fs for Hachioji range from 15.46-17.29 and those for Sone from 15.80-17.82. The results indicate that Hachioji chip is a H5 chondrite, the same group as Sone. Their cosmic ray exposure and K-Ar ages are close to each other, and average 19.3±2.9 Ma and 4.49±0.41 Ga, respectively. There is no difference in

petrologic and noble gas data of these two meteorites. This may indicate that the 0.1 gram chip found in the classical envelope was in fact part of Sone. However, considering the fact that H5 comprise ~20% of world meteorite collection, we cannot rule out the possibility that Hachioji and Sone fell separately but are the same group of meteorites.