CONTINUED SEARCH FOR Q IN DIFFERENT TYPES OF METEORITES BY THE PHYSICAL SEPARATION METHOD.

J. Matsuda[1], Y. Matsuo[1], C. Nishimura[1] and S, Amari[2]. [1]Department of Earth and Space Science, Graduate School of Science, Osaka University, Toyonaka, Osaka 560-0043, Japan (matsuda@ess.sci.osaka-u.ac.jp). [2]Laboratory for Space Sciences and the Physics Department, Washington University, St. Louis, MO 63130, U.S.A.

Introduction: Meteoritic separates that are enriched in the Q-gases have usually been prepared by the chemical procedure [1]. With Allende (CV3), Matsuda et al. [2] have shown that material that floats on the surface of the water ("floating fraction") during the freeze-thaw disaggregation exhibits the similar isotopic and elemental abundances to those of residues treated with HF-HCl. This method has been applied for a few fragments of Allende and floating fractions enriched in the Q-gases have always been recovered [3, 4].

This physical separation method was also applied for two ordinary chondrites (H/L3.2 and L4~6) [5]. The floating fractions from the two meteorites comprise 0.046 wt% and 0.0057 wt% of the bulk meteorite, respectively. Concentrations of the heavy noble gases (At, Kr and Xe) in the floating fraction from the H/L3.2 meteorite are similar to those of the bulk meteorite, indicating noble gases are not enriched in the floating fraction. Excesses in the heavy noble gases (1- 3 orders of magnitude of the bulk meteorite) are observed in the floating fraction of the L4-6 chondrite. However, Xe isotopic ratios of the fraction are identical to those of the air. Obviously, the physical separation method is not applicable to ordinary chondrites to concentrate the fraction enriched in noble gases.

In this study, we applied the physical separation method to Murchison (CM2), a carbonaceous chondrite in a different petrologic type from Allende (CV3).

Results and discussion: We started from 648.48 mg of a fragment of Murchison. After 120 cycles of the freeze-thaw disaggregation, 0.26 mg of the floating fraction was recovered. This yield (0.004%) is much smaller than the yield (0.068%) obtained after 216 cycles [4], however it is equivalent to the yield (0.004%) after ~120 cycles for Allende [3].

Elemental and isotopic abundances of noble gases in the floating fraction have been analyzed as well as elemental abundances of noble gases in the bulk Murchison. Pronounced enrichment of the heavy noble gases was not observed in the floating fraction from Murchison. Thus, Q in Murchison does not preferentially float on the surface, behaving the same way as the rest of constituents of the meteorite. EDX analysis of the floating fraction with scanning electron microscopy indicates most grains are silicates. This is consistent with the noble gas result and yet illuminates another difference from the Allende floating fractions, where many of the grains are carbonaceous.

It remains to be seen why the physical separation method can be successfully applied only to Allende: a make-up of carbonaceous matter in Allende may favor a preferential separation of Q (and presolar diamond) during the freeze-thaw disaggregation.

References: [1] Lewis R. S. et al. 1975, *Science* 190: 1251-1262. [2] Matsuda J. et al. 1999. *Meteoritics & Planetary Science* 34:129-136. [3] Zaizen S. et al. 2000. *Antarctic Meteorite Research* 13:100-111. [4] Amari S et al. 2003. *Geochim. Cosmochim. Acta* 67: 4665-4677. [5] Nishimura C. et al. 2004, *Meteoritics & Planetary Science* 39:A78.