IDENTIFICATION OF VARIETY OF CLASTS IN DAG 319 POLYMICT UREILITE USING THE SECONDARY ION MASS SPECTROMETER □OXYGEN-ISOTOPIC ANALYSES. N. T. Kita[1], Y. Z. Liu[1], Y. Ikeda[2], M. Prinz[3], and Y. Morishita[1], [1]Geological Survey of Japan, Higahsi 1-1-3, Tsukuba 305-8567, Japan, [2]Ibaraki University, Mito 310-8512, Japan, [3]American Museum of Natural History, New York NY 10024-5192, USA.

Introduction: Polymict ureilite DAG 319 contains a wide variety of mineral and lithic clasts [1]. Preliminary SIMS O-isotopic study of several clasts showed that their O-isotopic compositions are strongly related to their petrology [2]. (1) Ureilitic clasts show the oxygen isotopic compositions similar to monomict ureilites. (2) Plagioclase bearing felsic clasts also lie on the ureilite mixing line, indicating these clasts are the products of the magmatic activity on the ureilite parent body. (3) The O-isotopic compositions of chondrule and chondrite fragments are similar to ordinary and R chondrites, implying that these clasts were the projectile that collided into the ureilite parent body. In the previous study, the reproducibility of the $\delta^{18}O$ in the SIMS analyses was not better than 2‰ that caused some difficulty interpreting the results. In the present study, the multi-collection system is applied to the oxygen isotopic analyses and several data from clasts of the DAG 319 are reported.

SIMS Analyses: Oxygen-isotopic analyses were performed using the Cameca IMS 1270 at the Geological Survey of Japan. The 0.7–0.9 nA Cs+ primary ion was focused to 12 μm diameter on the sample surface and secondary O– ion was measured under the electron-gun for charge compensation. The secondary ions of ^{16}O (8×10^8cps), ^{17}O (3×10^5cps), and ^{18}O (2×10^6cps) were detected simultaneously on the multi-collection mode using three Faraday cup detectors ($10^{10}\Omega$ for ^{16}O and $10^{11}\Omega$ for ^{17}O and ^{18}O). The Mass resolution power was set to 4500 for ^{17}O using the variable exit slit on the axial detector and ~2000 for ^{16}O and ^{18}O using the exit slits of fixed width. The internal precision of 20 min analyses yielded 0.2‰ and ~1 ‰ (2σ) for $\delta^{18}O$ and $\delta^{17}O$ results. The instrumental mass fractionation effect is corrected using the terrestrial standards of olivine (Fo90, Fo60) and orthopyroxene (En90). The measured $\delta^{18}O$ for each standard do not vary more than 1‰ for each day. The $\Delta^{17}O = \delta^{17}O - \delta^{18}O \times 0.52$ was calculated for each data. The $\Delta^{17}O$ for terrestrial standards agree within an analytical error of 1‰.

Results and Discussion: Olivine and orthopyroxene grains of seven different clasts from DAG319 were analysed as shown in Fig.1. The ureilitic clasts, which resemble to the monomict ureilites, plot along the ureilite mixing line [3–4] with increasing ^{16}O enrichment for more magnesian samples. A large orthopyroxene clast (γ1 OPX-OL Clast; Type II) and troctolitic felsic clast (γ8 OL-An Clast) also plot on the mixing line with $\Delta^{17}O$~ -1‰. These compositions are similar to the monomict ureilites. It is consistent with the idea that these clasts were derived from the partial melt complimenting the ultramafic monomict ureilitic component [4]. An orthopyroxene grain set in a CI-chondrite like dark clast also showed a similar composition to monomict ureilites. Further investigation for their carbonates and magnetites may provide the relationship between the chondritic precursor and the differentiated components in the ureilite parent body.

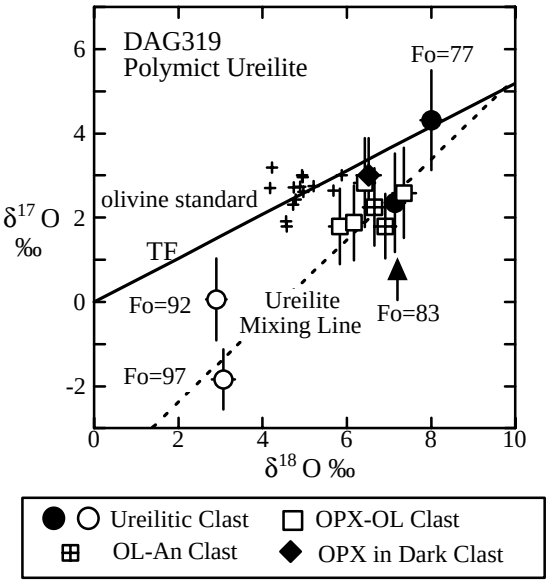

Fig. 1 Results of the SIMS oxygen isotopic analyses of clasts from DAG 319 polymict ureilite. Error bars are 2σ.

References: [1] Ikeda Y. et al. (2000) Ant. Meteor. Res., *13*, 177–221. [2] Kita N. T. et al. (1999) *Ant. Meteor. XXIV*, 72–74. [3] Clayton R. N. and Mayeda T. K. (1988) *GCA*, *52*, 1313–1318. [4] Ikeda Y. and Prinz M., this volume.