

RARE-EARTH-ELEMENT ABUNDANCE OF PYROXENE AND PLAGIOCLASE IN A PRISTINE EUCRITIC BASALT, YAMATO 75011,84. T. Arai¹, H. Takeda², J. J. Papike³, C. K. Shearer³, and M. Miyamoto¹, ¹Mineralogical Institute, Graduate School of Science, University of Tokyo, Hongo, Tokyo 113-0033, Japan, ²Research Institute, Chiba Institute of Technology, Tsudanuma, Narashino, Chiba 275-0016, Japan, ³Institute of Meteoritics, Department of Earth and Planetary Science, University of New Mexico, Albuquerque NM 87131-1126, USA.

Introduction: Eucrite basalts are products of the earliest planetary volcanism in the solar system. However, they generally suffered from brecciation and metamorphism on the parent body [e.g., 1] and thus their mineral chemistries and crystallization ages tend to be reset [e.g., 1,2]. Yamato (Y) 75011,84 is a basaltic clast in a polymict breccia and rarely preserves its primary texture, mineral composition, and crystallization age [3]. We analyzed REE abundance of pyroxene and plagioclase by ion microprobe and ensured its pristinity by comparing the REE abundance of the bulk clast with that of the parent magma calculated from the mineral compositions.

We investigated Y 75011,84 eucrite basalt from NIPR by chemical map analysis and analyzed REE of the spots of the earliest crystallization by the Cameca IMS 4f instrument operated by the University of New Mexico/Sandia National Laboratories Ion Microprobe Facilities.

Results and Discussion: Average REE abundance of pyroxenes and plagioclases is compared with bulk-clast REE abundance in Fig.1. All pyroxene cores from four zoned pyroxenes show almost identical abundances for HREE, although the LREE are scattered due to their extremely low concentration. Although analyses of Eu for all cores fall below detection limit, all have negative Eu anomaly. Two plagioclase grains were analyzed and their REE abundances are similar to each other, except Er and Yb. Pun and Papike [4] analyzed pyroxene cores from probably a similar clast (Y 75011,96) as Y 75011,84. However, REE abundances of

their cores are ~2–4 higher than that of our cores. This suggests that pyroxene cores in Y 75011,84 could be more primitive and more likely preserve compositions of a primary magma.

REE abundance of a parent magma was calculated from average REE abundances of pyroxenes and plagioclases, using partition coefficient *D* of McKay et al. [5] and Phinney and Morrison [6] respectively. Both calculated parent melts have REE abundance of ~20–30 CI chondrite and a fairly flat pattern, which well matches the bulk-clast REE abundance by Palme and Ikeda (1994, personal communication). This strongly supports a fact that cores of pyroxene and plagioclase in Y 75011,84 clast record the REE compositions of the parent magma.

The REE abundance of the parent magma for Y 75011,84 eucrite basalt is higher than those for REE-enriched ordinary eucrites, such as Nuevo Laredo and Stannern [7]. The flat REE pattern despite the highly enriched REE abundance, can be explained by the co-crystallization of pyroxene and plagioclase from the melt, in which REE abundance of the two minerals have complimentary trends.

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