ION MICROPROBE REE ANALYSES OF THE YAMATO 983885 LUNAR METEORITE

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Introduction: Yamato (Y) 983885 is a polymict regolith breccia derived from the Moon [1]. The meteorite contains various lunar crustal rocks such as Mg-rich rocks and a KREEP basalt, which is first reported among the lunar meteorites [2]. Here we report a preliminary ion microprobe REE data for individual minerals from the Y983885 lunar meteorite and implications for parent melt compositions of the Mg-rich clasts to better understand their connection to KREEP.

Sample and Methods: A polished thin section (PTS) Y983885,59-2 used in this study is described in detail by Arai et al. [2]. Ion microprobe analyses were carried out on the SHRIMP II at the National Institute of Polar Research, Japan. A modified energy filtering technique [3] was used to discriminate against complex molecular interferences.

Results and Discussion: Y983885 contains a variety of clasts consisting of a KREEP basalt, a Mg-rich troctolite/norite, a high-Al basalt, a very low-Ti basalt, and a granulite originated from ferroan anorthosite [2]. In this study, we focus on the Mg-rich troctolite, which is comprised of Ca-rich plagioclase (59.6 vol%), Mg-rich olivine (23.4 vol%), low-Ca pyroxene (15.5 vol%), and other minor/trace phases [2]. Two spots on plagioclase and three spots on pyroxene in the troctolite were analyzed. Plagioclase is LREE-enriched with La ~ 10 × chondrite and Lu ~ 0.5 × chondrite and displys a large positive Eu anomaly. Pyroxene is La ~ 1 × chondrite and Lu ~ 20 × chondrite with a negative Eu anomaly. These chondrite-normalized REE abundances of each mineral are broadly consistent with previous ion microprobe studies of Apollo samples [4, 5]. Using these REE abundances with appropriate partition coefficients, we can calculate the parent magma compositions, which can demonstrate a connection between Mg-rich rocks and KREEP basalt.

References: [1] Kaiden H. and Kojima H. 2002. *Antarctic Meteorites* XXVII:49–51. [2] Arai T. et al. 2005. *Antarctic Meteorite Research* 18:17–45. [3] Ireland T. R. et al. 1994. *Earth and Planetary Science Letters* 128:199–213. [4] Papike J. J. et al. 1996. *Geochimica et Cosmochimica Acta* 60:3967–3978. [5] Shervais J. W. and McGee J. J. 1998. *Geochimica et Cosmochimica Acta* 62:3009–3023.