

BASALTIC CLASTS IN LUNAR HIGHLAND BRECCIA YAMATO 86032.

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Introduction: Yamato (Y) 86032 is a feldspathic breccia from the lunar highlands, and is composed of at least three lithologies, white and light feldspathic lithology set in a dark-gray matrix (DG) and black impact melt veins [1]. We examined matrix components by optical and scanning electron microscopy and with an electron microprobe. The bulk composition of the DG was determined by ICP-MS and INAA.

Results and Discussion: The DG is composed of a wide variety of clasts such as glassy materials (devitrified impact melts and/or shock glass), granulitic breccias, basaltic components, and mineral fragments. The mineral fragments include plagioclase, pyroxene, olivine, silica minerals, Ti-rich or Al-rich chromite, and ilmenite [1]. Olivine compositions vary from Fo_{4.9-85.1}, the mg' of pyroxenes, 14.8-86.2, plagioclase compositions, An_{68.8-97.9}. These chemical variations imply a wider range of components from mare and highland than previously reported [2].

We found possible clasts of mare basalts. One of the mare basalt displays an ophitic texture, composed of plagioclase lath (<340 x 80 μm) and interstitial pyroxene with minor amount of silica, Ti-rich phases, and mesostasis. The other clast is brecciated and has a similar mineral assemblage. Pyroxene is widely zoned from core to rim (En_{4.7}Wo_{71.5} to En₁₀Wo₋₂₅₋₃₅), and shows a strong correlation between Fe/(Fe+Mg) and Ti/(Ti+Cr), distributing along as the similar range of VLT basalts [3]. These chemical variations in pyroxenes resemble to those of basaltic clasts in Y791197, but different from those in paired Y82192 [3,4]. There are many olivine and pyroxene fragments relatively rich in Fe. These Fe-rich clasts could be fragments of mare basalts although we cannot rule out the possibility that these clasts represent an extreme differentiate of highlands affinity.

Our bulk analyses generally indicate that the DG is mostly composed of the lunar highland components (Al = 16.0, Ca = 11.3, Fe = 4.09, and Ti = 0.14 wt%). The abundances of REEs are chondrite x2.5-4.4 with a positive Eu anomaly within the range of previous analyses [5]. Th (0.191 ppm) and U (0.0564 ppm) are extremely low, indicating the absence of KREEP components. This implies that this meteorite came from farside highlands, giving us an opportunity to study mare basalts of these regions.

References: [1] Yamaguchi A. et al. 2004. Abstract #1474 Lunar & Planetary Science Conference. [2] Takeda H. et al. 1990. *Proc. 20th Lunar Planet. Sci. Conf.*: 91-100. [3] Nielsen R.J. and Drake M.J. 1978, *Mare Crisium: The View from Lunar 24*. pp.419-428. [4] Goodrich C.A. et al. 1987. *Mem. NIPR, Spec. Issue 46*: 56-70. [5] Koeberl C. et al. 1989. *Proc. NIPR Symp. Antarct. Meteorites 2*:15-24.