

RARE-EARTH AND BARIUM ABUNDANCE FEATURES OF FOUR APOLLO 16 SAMPLES. A. Masuda and N. Nakamura (Dept. of Chem., Science University of Tokyo, Kagurazaka, Tokyo), and H. Kurawasa and T. Tanaka (Geological Survey of Japan, Hisamoto, Kawasaki, Japan).

Rare-earth elements and barium in the following four samples were determined accurately by mass spectrometric stable-isotope dilution technique. The points of our observation may be summarized as follows: (1) the investigated Apollo 16 materials, except for cataclastic anorthosite 60025, have rather small Yb positive anomalies of 3-6%, (2) the anorthosite 60025 has much greater positive Yb anomaly, (3) the igneous rock 66095 shows a positive Ce anomaly of about 9%. The small positive Yb anomaly may suggest the possible presence of the positive greater anomaly for Eu in local original source materials of the Moon.

(1) 66095,52 (igneous rock). As observed previously (ref. 1), La, Nd and Sm fall almost on a rectilinear line, but Ce deviates from the line by about 9%. The RE abundances in this rock is pretty similar to those in Apollo 15 fines 15101 and 15401. The Ba normalized value is lower than that for La.

(2) 61016,145 (type II). This material represents the dark material of rock 61016 (Butler and Bass). It appears that this sample has no Ce anomaly and La is somewhat impoverished when compared with the extended "normal" line. As a result, the normalized value for Ba is higher than that for La.

(3) 67915,57 (type IV). The investigated sample was almost white. The resultant RE pattern is slightly upwards concave as a whole. This concave curve might be explained in terms of mixture of different materials. Alternatively, one could consider that the studied material represents the liquid which was produced under a equilibrium where total solid (not only solid surface) in a closed cell was equilibrated with the liquid concerned.

(4) 60025,76 (type II). The RE pattern for this cataclastic anorthosite resembles that for anorthosite 15415 investigated by Hubbard et al. (ref. 2), but the absolute concentration level in 60025 is higher than in 15415, by factors of 1.3-2.5. Although the given specimen was pulverized totally, the abundances of heavy RE elements are variable depending on the portions taken; one (solid circles for 60025 in Fig. 1) has a positive Yb anomaly of 28% and another (open circles for 60025 in Fig. 1) has a corresponding anomaly of 41%. Besides, the markedly high normalized value for Ba is worth mentioning. (The similar effect is seen in ref. 2.) The 60025 anorthosite shows no positive Ce anomaly, whereas 15415 appears to have it. The Eu abundance in 60025 is virtually the same as in 67915.

1) Masuda et al. (1972) *Geochim. Acta, Suppl.* 3, 2, 1307

2) Hubbard, N. J. et al. *Abstract, 3rd Lunar Sci. Conf.* 404p.

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