Incompatible element ratios and Sr-Nd isotopic compositions for basalts erupted from Fuji, Komitake and Ashitaka volcanoes.

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Incompatible element ratios and Sr-Nd isotopic compositions of basalts erupted from Fuji, Komitake and Ashitaka volcanoes are studied comparatively. The results of study are summarized as follows.

(1) 87Sr/86Sr and 143Nd/144Nd ratios for basalts of Kofuji and Shinfuji volcanoes are 0.703279 to 0.703466 and 0.703394 to 0.703504, and 0.513027 to 0.513055 and 0.513028 to 0.513079, respectively. Sr isotopic composition of Ashikata volcano is similar to those of Fuji volcano. Sr and Nd isotopic compositions of these volcanoes are nearly the same.

(2) 87Sr/86Sr and 143Nd/144Nd ratios for basalts of these volcanoes are lower than those of Izu-Oshima, Hachijyojima and Miyakejima volcanoes, and similar to Niijima except for slightly higher 87Sr/86Sr ratio.

(3) Contrary to Sr and Nd isotopic compositions, incompatible element ratios of these volcanoes are various. Rb/Y, Ba/Y, Zr/Y and Nb/Y ratios of Shinfuji volcano are higher than those of Kofuji volcano. The ratios of Komitake volcano are similar to those of Kofuji volcano, but it is rather complicated in the case of Ashitaka volcano. The ratio of Rb/Y, Ba/Y, Zr/Y and Nb/Y for basalts of older cone of Ashikata volcano varies irregularly and no systematic change with time is observed. The range of incompatible element ratios of Ashitaka volcano equals to those of both of Shinfuji and Kofuji volcanoes.

(4) The difference of incompatible element ratios among these volcanoes cannot be explained by a degree of partial melting of mantle peridotite with the same chemical composition, judging from their similar Sr contents (Togashi et al.,1997 etc.). It is difficult to derive them from chemically heterogeneous mantle materials produced in the past by depletion or enrichment of incompatible elements, because 87Sr/86Sr and 143Nd/144Nd ratios are nearly the same. It is also hard to relate them to the addition of incompatible elements by slab-derived fluid enriched in seawater component with high 87Sr/86Sr ratio, for their Sr isotopic compositions are similar. Other processes are needed to explain the difference of incompatible element ratios. Chemically heterogeneous mantle produced by mixing or mingling of peridotite with basaltic component, which is the melting product of mantle material, may be a possible candidate for the source.