

Geochemical characteristics of apatite in Heavy-REE-rich deep-sea mud from Minami-Torishima area, southeastern Japan

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Since the discovered of a REY-rich mud from the Pacific deep-sea floor, numerous geochemical data was reported about the REY-mud. However, the distribution of REY and its host-phase in the REY-mud are still controversial. We made geochemical and mineralogical investigations of the REY-mud from Minami-Torishima area to clarify it.

Whole-rock compositions of the REY-mud have positive collations among CaO, P₂O₅ and total REY contents. Relative abundance of apatite has also positive collations to P₂O₅ and total REY contents. It suggests that a main host phase of REY in REY-mud is apatite. To give a quantitative estimation of the REY-host phase, we also make *in-situ* compositional analyses of constituent minerals in the REY-mud. As a result, we found that the apatite is abundant in REY (9300–32000 ppm) and characterized by negative Ce-anomaly. The other minerals, enriched in Si and/or Al (phillipsite, illite and quartz) are less abundant in REY (60–170 ppm). The Simple mass-balance calculation shows that up to 80 % of REY in the mud are contained by apatite. On these grounds we have come to the conclusion that the main REY host phase of the REY-mud is apatite.