

The latest research on REY-rich mud in the Pacific Ocean

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Deep-sea mud enriched in rare-earth elements and yttrium (REY), termed as REY-rich mud, has been expected as a novel mineral resource for the critical elements. A recent discovery of the extremely REY-rich mud with the maximum total REY content of ~8,000 ppm in the Japanese Exclusive Economic Zone (EEZ) around Minamitorishima Island makes it realistic to economically develop the highly promising deep-sea mineral resource.

In the presentation, we report the progress of our researches on the REY-rich mud within the Minamitorishima EEZ towards the world's first development of deep-sea mineral resources. Moreover, we also introduce our latest findings including the basin-wide spatial distribution of the muds with a high resource potential and various genetic components identified in the western North and central to eastern South Pacific REY-rich muds. Our accumulation and integration of the scientific knowledge about deep-sea sediments including REY-rich mud strongly suggest an intrinsic linkage between the formation of deep-sea mineral resources and Earth system dynamics such as climate change, geochemical cycles, and plate tectonics, which can offer new insights into resource geology, oceanography, paleoclimatology, and solid earth science.

Keywords: deep-sea mineral resource, REY-rich mud, Minamitorishima Island, western North Pacific, South Pacific