

The origin of seafloor surface sediment in the western North Pacific Ocean

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In 2013, the deep-sea sediment containing an extraordinarily high concentration (more than 6000 ppm) of rare-earth elements and yttrium (REY) was discovered within the Japanese exclusive economic zone (EEZ) surrounding Minamitorishima Island [1, 2]. The presence of such deep-sea sediments with extremely high concentrations of REY strongly attracts our attention from both paleoceanographic and resource-geologic view points. Although geochemical data of deep-sea sediments within the Minamitorishima EEZ have been accumulated, the origin of the sediments including the "extremely REY-rich mud" has not been completely elucidated yet.

Here, as the first step for the comprehensive elucidation of the origin of the deep-sea sediments in the Minamitorishima EEZ, we analyzed the modern, uppermost sediment samples collected from the Minamitorishima EEZ. We investigated (1) mineralogical compositions, (2) bulk chemical compositions, and (3) bulk Nd isotopic ratios. The results show that the surface sediment samples in this study have total REY contents less than 400 ppm, i.e., they are not REY-rich mud. Their chemical and isotopic compositions can be explained by a mixture of 80–90% of terrigenous component and 20–10% of hydrogenous component.

[1] Iijima et al., *in revision*.

[2] Fujinaga et al. (2013) JpGU2013