

Mineralogical features of REY-rich mud in EEZ around Minamitorishima and implications for its genesis

OTA, Junichiro^{1*}; TAKAYA, Yutaro²; FUJINAGA, Koichiro²; YASUKAWA, Kazutaka¹; NAKAMURA, Kentaro¹; MACHIDA, Shiki³; HARAGUCHI, Satoru¹; KATO, Yasuhiro²

¹Department of Systems Innovation, University of Tokyo, ²Frontier Research Center for Energy and Resources, University of Tokyo, ³Department of Resources and Environmental Engineering, Waseda University

The KR13-02 cruise was conducted in the southern part of the Minamitorishima to explore rare-earth elements and yttrium-rich mud (REY-rich mud) within Japanese Exclusive Economic Zone (EEZ) on January 2013. During the cruise, seven sediment cores were successfully collected. The results of bulk sediment analyses showed that one of the cores (PC05) has an extremely REY-concentrated layer with 6,596 ppm total REY (Kato et al., 2013; Suzuki et al., 2013) which is three times higher than the maximum concentration in the mud previously reported for the eastern South and central North Pacific Ocean (2,230 ppm; Kato et al., 2011). In addition to REY, P concentration in the layer is also noticeably high (Kato et al., 2013; Suzuki et al., 2013), suggesting that Ca phosphate (apatite) is mainly responsible for the REY-enrichment in the layer, as in the case for the mud presented in other areas (Kashiwabara et al., 2014). However, factors contributing the extreme enrichment of REY, which in turn might provide important insights into the genesis of REY-rich mud, are still uncertain. In the present contribution, we report mineralogical features of Minamitorishima REY-rich mud including the extremely REY-concentrated layer and discuss about its genesis.

Keywords: rare-earth elements (REEs), REY-rich mud, deep-sea mineral resource