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Grain size distributions of REY-rich mud in the Exclusive Economic Zone around Minamitorishima Island

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Rare-earth elements and yttrium (REY)-rich mud (REY-rich mud) is a pelagic sediment with high total REY content (>400 ppm), and has a potential as a new REY resource (Kato et al., 2011). On January 2013, the KR13-02 cruise operated by JAMSTEC collected seven piston cores from the Exclusive Economic Zone around Minamitorishima Island (Minamitorishima EEZ) for scientific investigation of the REY-rich mud. Subsequently, one of these cores (PC05) was found to include extremely REY-enriched layer whose total REY content exceeds 6,000 ppm (Fujinaga et al., 2013; Kato et al., 2013; Suzuki et al., 2013).

It is currently quite important to understand the formation mechanism of this “extremely REY-rich mud” for scientific investigation of the mud in the Minamitorishima EEZ. A recent study on the PC05 core showed that the REY-enriched layer contains significant amounts of large apatite grains and large phillipsite grains (Ohta et al., 2014). In the present contribution, we report grain size distribution (GSD) analyses for bulk sediments and specific minerals (apatite and phillipsite) in the KR13-02 cores including extremely REY-rich mud, and implications of these minerals for REY-enrichment.

Keywords: REY-rich mud, apatite, phillipsite, grain size distribution