

Rare earth element geochemistry of shelf sediments in the western part of Jeju Island, Korea

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ABSTRACT

The sediment geochemistry, including REE of surface and core samples in the western part off Jeju Island have been carried out in order to understand the provenance and hydrologic sorting.

The sediment in the study area were primarily composed of coarse silt with a mean grain size of 2.8~82.8 μm . The ratios of TOC over total nitrogen (TN) showed that the study area sediments contained more organic matters of marine origin than those of terrigenous origin. The total Al₂O₃, Fe₂O₃, K₂O, MgO, and MnO contents and REE concentration of the fine sediments are higher than those of the coarse sediments. The higher Zr/Th and Zr/Yb ratios in coarse sediments relative to fine-grained detritus indicates sedimentary sorting. Grain size influence the REE concentrations of the study area sediment significantly. The <63 μm fraction of the sediment has higher REE concentration and different REE patterns when compared with those in bulk samples, due to the presence of REE-enrich heavy minerals. The REE distribution patterns of the western part of Jeju Island sediments are relatively enriched in most LREEs than the Yellow River sediment and depleted in the Changjiang River, but the LaN/YbN ratios are similar to the Changjiang sediment. The Eu/Eu* ratios ranged from 0.594~0.665(0.631) is much similar to the Yellow River sediment, possibly mixture of the sediments from these two rivers.