Sulfur isotopic composition of sulfides in sediment and sulfate ion in the bottom sea water of the Kagoshima Bay, Kyushu

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The Kagoshima bay is a part of the graven expanding E-Wdirection in recent 3 m.y. Two giant calderas are the south and northern end of the bay. The northern caldera has been formed during twice collapses; Giant Aira caldera and small Wakamiko caldera. The fumarole of volcanogenic hydrothermal fluid and gases are frequently recognized in or around Wakamiko caldera. Also the Wakamiko caldera is filled by anoxic seawater in summer. Sulfate reducing bacteria well produce H2S gas that is converted to framboidal pyrite (we call there as hydrothermal area). Stagnation of seawater has not been reported from the other area of Kagoshima bay, and seawater is always open to the ocean (we call as non-hydrothermal area). Recently the number of cultivation farm increase gradually along the coast of the bay and red tide happen occasionally. However, the frequency of the trouble is rather rare compared to the bays near big cities. Small amount of production of H2S and framboidal pyrite is recognized there at the bottom of non-hydrothermal area.

In this study, about 50drill cores were collected from all the area of the bay. Sulfur of H2S and pyrite were extracted from the sediments individually, and isotopic compositions were measured. In addition, isotopic compositions of sulfate sulfur from the seawater just above the core were measured. To understand the mechanism how the dissolved sulfur is fixed into sediments by bio-activity is very important to observe the marine environments and to decipher the pyrite in the sedimentary rocks as a chemical fossil.

The lengths was from 5 to 40 cm, which is shallower than the depth to the Taisho pumice fall(Oki,1989), The collected core was separated into small unit of 1 to 2 cm in length, and the sample was immediately mixed with Zn acetate to fix the H2S gas. In a laboratory, ZnS, pyrite and sulfate in seawater were converted SO2 gas, individually.

Sulfur isotopic compositions of bottom seawater range from +20 to +22 permil, and there is no difference place to place.

The isotopic compositions of H2S and pyrite distributed from –35 to –5 permil, and the values of H2S are generally higher than those of pyrite.

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