

Behaviors of nitrogen and sulfur in hydrothermal fluids from Suiyo SeaMt. Izu-Bonin Arc

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Concentrations of ammonium and sulfide ions in the hydrothermal fluids from Suiyo Seamount were determined in order to know their geochemical flux which would be available for chemosynthesis. Since sediment on the Suiyo Seamount caldera floor mainly consists of volcanoclastic material, very little amount of land-derived organic matter would be involved into the fluid during hydrothermal circulation. Both nitrogen and sulfur are attributed to be derived from inorganic source related with volcanic activity.

Fluid samples were collected during two dive programs using Hakuyo2000 in August, 2001 and using SHINKAI2000 in October, 2001. Both ammonium and sulfide ions were analyzed onboard immediately after sample distribution, by conventional colorimetric techniques; indo phenol method for ammonium and methylene blue method for sulfide. For sulfur isotope ratio measurement in the on-shore laboratory, cadmium sulfides or zinc sulfides were precipitated from some samples.

Endmember concentrations of ammonium and sulfide ions were 25 μ M and 2.5 mM, respectively. These values were in the range of those from the hydrothermal systems in sediment-poor environment. Sulfur isotope ratio of sulfide ($\delta^{34}\text{S} = +0.2$ to $+2.9$ per mill) suggests its magmatic origin. On the assumption of the W/R ratio of 3.6 which was estimated from strontium isotope systematic, volcanic rocks would contribute enough amount of ammonium into the fluid. The results are consistent with that both nitrogen and sulfur are derived from inorganic source.