

Behaviors of dissolved metals in hydrothermal plumes and diffused flows at the Suiyo Seamount, Izu-Bonin arc

Kei Okamura[1], Hiroshi Hatanaka[2], Koichi KISHIDA[3], Masaaki Suzuki[3], Yoshiki Sohrin[1], Junichiro Ishibashi[4]

[1] ICR, Kyoto Univ., [2] Ecosystem Management, Univ. of Siga Pref., [3] Chemistry, Kyoto Univ., [4] Dept. Earth & Planet. Sci., Kyushu Univ.

<http://inter3.kuicr.kyoto-u.ac.jp/>

We studied for hydrothermal plumes and hydrothermal diffused flows at the Suiyo Sea mount in the Izu-Bonin arc by using in situ Mn-Fe analyzers (GAMOS). GAMOS is an in-situ chemical analyzer used to detect manganese and/or iron anomalies in neutrally buoyant plumes and to map manganese distribution in bottom seawater over vent fields. GAMOS-IV was deployed on seafloor for long term observation of manganese concentration and water temperature in hydrothermal diffused flow using manned submersible SHINKAI 2000 in September, 2001 and ROV Dolphin 3K in August, 2002. Anomalies of manganese concentration (- 4,000 nM) and water temperature (- 6.0 degC) were observed coincidentally. The Mn/delta-T ratio observed at this diffused flow were almost same with high temperature fluid in the seamount and uniform throughout each two deployments. This indicates that the diffused flow in the Suiyo seamount had single source fluid same as the high temperature fluid. During the observation at the Shell carpet in August 23-24, 2002, lower Mn/delta-T ration than high temperature fluid was observed between 15:30-16:30, Aug 23. This indicate that manganese was selectively removed from the diffused flow.

During NT 01-09 (SHINKAI 2000 / NATSUSHIMA, JAMSTEC) and KR 01-15 (KAIREI, JAMSETC) cruises, GAMOS-II measurements were conducted for plume observation. Manganese, iron concentrations and temperature anomalies were observed in the caldera of the Suiyo seamount. Three maxima in temperature were detected at 1,080 m, 1,200 m and 1,280 m. But only one peak was observed for iron and manganese. Shallow plum at 1,080 m has a lower Metal /heat ration compared to deeper plume. This research is funded by Ministry of Education, Science & Technology through Special Coordination Fund ARCHEAN PARK project, and Industrial Technology Research Grant Program in '2002 from New Energy and Industrial Techonolgy Development Organization (NEDO) of Japan.