New scientific results

We reported helium-3 plumes in the central Indian Ocean (GI04). The vertical distribution of $\delta^3$He showed a similar trend with dissolved iron and manganese distributions in the hydrothermal plume. Lateral $\delta^3$He distribution at mid-depth suggests that the helium-3 plume in the central Indian Ocean derived from the Central Indian Ridge around 20°S (Takahata et al., Terrestrial, Atmospheric and Oceanic Sciences, 2018).

New GEOTRACES publications (published or in press)

Fifteen papers have been published as shown below:


**GEOTRACES workshops and meetings organised**

• We had a workshop, entitled "BioGEOTRACES-Japan begins” on September 19-21, 2018 at Nagasaki University, Nagasaki to evaluate the potentials of biological studies related to trace elements and their isotopes (TEI) in the ocean, and to find the future directions of these studies in Japan. For three days, 15 registered Japanese scientists took part in the workshop. We invited Drs. Maria Maldonado and Tung-Yuan Ho as guest speakers. The workshop consisted of 3 invited talks, 3 keynote talks and 11 research topics related to GEOTRACES & BioGEOTRACES. During the workshop, we discussed recent scientific findings, and possible future collaborations among TEI chemists, biologists and modelers.
• Domestic GEOTRACES session was held during annual meeting of Geochemical Society of Japan 2018 in September 11-13, 2018, for pursuing scientific discussion on recent Japanese GEOTRACES studies (30 papers were presented). This annual meeting was held at Ryukyu University, Okinawa.
• We had a national GEOTRACES symposium in February 21-22, 2019, for promoting scientific discussion on recent Japanese GEOTRACES studies (29 papers were presented). We also had a business meeting as a GEOTRACES sub-committee meeting under the national SCOR committee (Science Council of Japan) on February 22, 2019. These symposium and meeting were held at the Atmosphere and Ocean Research Institute, the University of Tokyo.

**GEOTRACES presentations in international conferences**

• During Goldschmidt Conference 2018, several GEOTRACES-related sessions were held. More than 8 papers were presented by Japanese scientists during the Goldschmidt Conference 2018 as listed below.

There were more presentations in the Oceanographic Society of Japan, Japan Geoscience Union etc.

**Other GEOTRACES activities**

The 2nd workshop of WESTPAC WG06 “A framework for cooperative studies in the Western Pacific Marginal Seas: Energy and materials exchange between land and open ocean” (PI, Jing Zhang; 2017-2020), was held in Qingdao, China, on 17 and 18 December 2018, where 28 experts from 6 countries in the East and Southeast Asia gathered along with one participant from US. During a half day sub-session, TEI including GEOTRACES parameters, such as 1) Fe, Al, Mn; 2) REEs, Nd isotope; 3) Ra, Rn; 4) Hg; 5) paleo proxies etc. especially in the East China Sea and West Pacific Ocean, were discussed.

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