

Nd concentration and isotopic composition in the south Indian Ocean and Indian sector of the Southern Ocean

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The Indian Ocean is one of the key oceanic regions to elucidate the global thermohaline circulation. For this reason, revealing the present circulation pattern in the Indian Ocean would extend our knowledge on both present and past global circulations. Under the GEOTRACES program, we determined the Nd concentration and isotopic composition of seawater in the south Indian Ocean and Indian sector of the Southern Ocean to investigate the present regional ocean circulation.

Two stations, ER-11 (30°S, 65°E) and ER-12 (37°45'S, 57°37'E), in the south Indian Ocean, and one station, ER-14 station (62°S, 40°E), in the Indian Sector of the Southern Ocean were studied. Nd isotopic composition was determined on a MC-ICP-MS, NEPTUNE at the HISPEC, NTU, and Nd concentration was determined on a ICP-MS, Agilent7500 at JAMSTEC.

At ER-11 station, the surface to 200 m depths data show $\epsilon_{Nd} = -13.0$ to -11.5 , indicating an existence of the South Indian Central Water (SICW). The ϵ_{Nd} values gradually increase along with depths around 1000 m ($\epsilon_{Nd} = \sim -8$), where the Antarctic Intermediate Water (AAIW) occupies. Below the depths, the ϵ_{Nd} profile keeps a constant value ($\epsilon_{Nd} = -9$ to -8). The Nd concentration data show a narrow range (4 to 7 pmol/kg) at depths above 1250 m and gradually increase to 25 to 30 pmol/kg in deeper depths.

The ϵ_{Nd} profile at ER-12 station shows a minimum value at surface ($\epsilon_{Nd} = \sim -15$) and increases to the bottom ($\epsilon_{Nd} = \sim -8$), which is different from that at ER-11. The ϵ_{Nd} values of ER-14 station in the Southern Ocean show a very narrow range from -9 to -8 . This trend is identical with the data at the Atlantic Sector of the Southern Ocean reported by Stichel *et al.* [1].

[1] Stichel *et al.* (2012) *EPSL* **317**, 282-294.