Distributions of Nd isotopic composition and REE concentrations in surface seawater in the North Pacific Ocean

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Nd isotopic composition (ε_{Nd}) of seawater has been reported in many oceanic regions[1]. However, Nd isotopic composition data in the North Pacific Ocean, have not been collected intensively, which makes it difficult to proceed with a comprehensive discussion. In this study, we aimed to investigate the disribution of Nd isotopic composition and REE concentrations in surface seawater over a wide area of the North Pacific Ocean and to uderstand their circulation process.

Surface seawaters were collected from the equatorial Pacific to the subarctic regions (0º-55ºN, 170ºW) during R/V Hakuho-Maru KH-14-3 Cruise. Seawater samples for Nd isotope analysis were collected from underway sampling system by using MnO_2fiber. REE concentrations were measured by ID-ICP-MS after Fe-hydroxide coprecipitation. Nd isotopic composition was measured by TIMS after purification of Nd[2].

Dissolved Nd concentrations in surface seawater systematically increased (3.3 – 9.8 pM) with latitude. Nd isotopic composition showed distinctive features in each surface water mass. Pacific Equatorial Water (0°-10°N): -1.7 < ε_{Nd} < -0.5, North Pacific Central Water (10°-32°N): -2.7 < ε_{Nd} < -2.0, North Pacific Transition Zzone (32°-42°N): -4.7 < ε_{Nd} < -5.2, Pacific Subarctic Upper Water (42°-52°N): -3.5 < ε_{Nd} < -2.7.

In this study, we will apply 3-box model to the North Pacific Ocean (Tropical area, Subtropical area and Subarctic area), and discuss geochemical cycles of Nd and its budget.

[1] Lacan et al., 2012, *Chem. Geol.* **300-301**. 177-184.
[2] Tazoe et al., 2007, *Mar. Chem.* **103**. 1-14.