

Distributions of dissolved zinc in the western and central North Pacific

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Introduction

Zinc (Zn) is an essential nutrient for marine microorganisms and a key parameter of international GEOTRACES project. Recent studies have revealed basin-scale distributions of dissolved Zn and investigated the relationship between dissolved Zn and Si [1, 2]. In the subarctic North Pacific, the relationship between dissolved Zn and Si is very different from that in other open oceans [3, 4]. However, the Zn and Si decoupling is not clarified yet because of the lack of a comprehensive data. In this study, we investigated the large-scale distributions of dissolved Zn in the western and central North Pacific.

Methods

Seawater samples were collected during the R/V Hakuho-maru KH-12-4 GEOTRACES GP 02 cruise (from August to October 2012), by using acid-cleaned Teflon-coated X-Niskin samplers deployed on CTD-CMS. Zn in seawater was determined with cathodic stripping voltammetry (CSV) with ammonium 1-pyrrolidinedithiocarbamate (APDC).

Results and Discussion

The concentrations of dissolved Zn in the intermediate waters (sigma-theta: 26.6 – 27.5) of the western subarctic North Pacific were higher than those in deep waters. The relationship between Zn and Si in the intermediate waters of the western and central subarctic North Pacific was very different from that in the other areas, while the relationship between Zn and P in the intermediate waters was similar. The decoupling of dissolved Zn and Si in the subarctic North Pacific is strongly influenced by intermediate water masses.

[1] Wyatt, Milne, Woodward, Rees, Browning, Bouman, Worsfold, Lohan (2014) *Global Biogeochem. Cycles* **28**, 44-56. [2] Roshan and Wu (2015) *Global Biogeochem. Cycles* **29**, 1060-1074. [3] Kim, Obata, Kondo, Ogawa, Gamo (2015) *Mar. Chem.* **173**, 330-341. [4] Janssen and Cullen (2015) *Mar. Chem.* **177**, 124-133.