

<u>TOP</u> > <u>Available Issues</u> > <u>Table of Contents</u> > Abstract

ONLINE ISSN : 1880-1404 PRINT ISSN : 0916-717X

JST Link Cen

## **Biomedical Research on Trace Elements**

Vol. 16 (2005), No. 4 281-284

[PDF (416K)] [References]

## The dynamics of dissolved and acid-dissolved species in the northwest subarctic Pacific

Yuki Munebayashi<sup>1)</sup>, Masatoshi Kinugasa<sup>1)</sup>, Seiji Nakatsuka<sup>1)</sup> and Chiharu Minami<sup>1)</sup>

1) Institute for Chemical Research, Kyoto University

(Accepted: October 12, 2005)

## Abstract:

The first mesoscale iron-enrichment experiments in the northwest subarctic Pacific were conducted in July-August 2001 (SEEDS2001) and July-August 2004 (SEEDS II). During these experiments, the dynamics of dissolved and acid-dissolvable trace metals were studied. For SEEDS2001, seawater samples were collected from the upper water column (5-70 m) of In- and Out-patch stations. Immediately after the collection, an aliquot of seawater for dissolved species was filtered through a  $0.2\mu$ m filter and acidified to pH 2.2. An aliquot for acid-dissolvable species was acidified without filtration and stored for 3 years at an ambient temperature. Before the Fe enrichment, the concentration of dissolved Fe in the surface mixed layer was <0.13 nM (the detection limit) and that of acid-dissolvable Fe was 4.7 nM. The difference was a particulate fraction. Since the photochemical quantum efficiency of algal photosystem II was low, Fe in this fraction was not easily available to phytoplankton. After the Fe enrichment, acid-dissolvable Fe in the patch decreased from 9.6 nM on day 2 to 4.6 nM on day 13 after starting the experiment, which was still  $\sim$ 3 nM higher than that at the Out-patch station. Dissolved Fe was 1.4 nM on day 2 and decreased exponentially to <0.13 nM on day 11. The concentration ratio of the acid-dissolvable fraction to the dissolved fraction for the other trace metals was lower than that for Fe. The acid- dissolvable concentrations for Co, Ni, Cu, Zn and Cd did not show significant changes. The dissolved concentrations in the surface layer decreased exponentially. The molar ratio of the concentration difference between days 2 and 13 was similar to the elemental ratio reported for phytoplankton. These are the first data showing that mesoscale

iron-enrichment alters the dynamics of dissolved Co, Ni, Cu and Zn. On the contrary, significant decrease in the dissolved concentration was not detected except for Cd during SEEDS II.

Key words: mesoscale iron-enrichment, northwestern North Pacific Ocean, trace metals, SEEDS2001, SEEDS II



Download Meta of Article[<u>Help</u>] <u>RIS</u> <u>BibTeX</u>

To cite this article:

Yuki Munebayashi, Masatoshi Kinugasa, Seiji Nakatsuka and Chiharu Minami, "The dynamics of dissolved and acid-dissolved species in the northwest subarctic Pacific", Biomedical Research on Trace Elements, Vol. **16**, pp.281-284 (2005).

## JOI JST.JSTAGE/brte/16.281

Copyright (c) 2006 by Japan Society for Biomedical Research on Trace Elements



Japan Science and Technology Information Aggregator, Electronic

