

Distributions of Total Particulate Trace Elements in the Subarctic North Pacific

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Marine suspended particulate matter (SPM) may dominate the distributions and cycles of dissolved trace elements in the ocean through interaction with ambient seawater. In order to study the marine biogeochemical cycle of trace elements, it is important to determine both the dissolved and particulate species.

In this study, we have investigated the subarctic North Pacific known as a high nutrient, low chlorophyll (HNLC) region. SPM samples were collected on PES filter (0.2 μm) during the R/V *Hakuho-Maru* KH-17-3 cruise (June-Aug. 2017). Samples were analysed by ICP-MS. We report the distributions of total particulate trace elements (pTE) along the 47°N east-west transect.

pAl, pTi and pFe concentrations were very low in surface and increased nearly linearly with depth. Concentrations of pP, pZn, and pCd were maximum at surface and decreased exponentially with depth. There was a strong correlation between pAl and pTi in all samples ($r^2 = 0.994$, $n = 100$) and the pTi/pAl molar ratio obtained by the regression line is 0.0294 nmol/nmol. This ratio is comparable to a reported estimate for Upper Continental Crust materials (0.0281)^[1]. This indicates that lithogenic materials originating from UCC were supplied to the subarctic North Pacific. We also found there was a strong correlation between pMn and pCo corrected for lithogenic fraction below 150 m except CL21, the easternmost station ($r^2 = 0.807$, $n = 74$). This result implies scavenging of dissolved Co on Mn oxides.

[1] Hu and Gao (2008) *Chem. Geol.* **253**, 205 -221