

## The sectional distributions of several particulate trace elements in the western South Pacific

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Trace elements in the ocean play important roles as micronutrients, proxy and tracer in the oceans. Our knowledge of suspended particulate trace elements is, however, limited especially in the western part of the South Pacific. In this study we report the meridional sectional distributions of suspended particulate trace elements, such as Al, P, Ti, Mn, Fe, Co, Cu, Zn, Mo, Cd, Pb in the South Pacific. Seawater samples were collected at stations of GR 8 near the Antarctic Polar Front, GR 10, GR 12, GR 13, GR 15, GR 17, GR19 and GR21 in the equator along the 170°W meridian during the KH-14-6 GEOTRACES Japanese cruise by R/V Hakuho-Maru. Sub-samples were filtered through a 0.2 µm supor membrane filter and the filtered particle samples were frozen until the analysis. A half portion of the filter samples was digested using a mixed acid solution of 8 M nitric acid - 4 M hydrofluoric acid at 110°C. After complete dryness of the digested samples, residues were dissolved and diluted in 0.5 M nitric acid. The concentrations of trace elements were measured using a HR-ICP-MS.

At all the stations particulate P, Mo, and Cd concentrations were high in the surface waters followed by rapid decreasing with depth, similar to the distribution pattern observed in the North Pacific. Other trace elements, such as Al, Ti and Fe show surface depletion, relatively low concentrations in the deep water column and increasing toward the maximum near the seafloor. In the upper water column, Cd/P ratios are fractionated between subantarctic/Antarctic region and subtropical/tropical region with the former region showing higher Cd/P ratios. The high Cd/P ratios are similar to our previous observations in the subarctic eastern North Pacific during the KH-17-3 cruise. These results appear consistent with preferential uptake of Cd relative to P by phytoplankton in iron-limited region [1].

[1] Cullen J.T. *Limnology and Oceanography* 51. 1369-1380 (2006).