

Determination and distribution of Zr, Hf, Nb, Ta and W in the North Pacific Ocean

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Dissolved Zr, Hf, Nb, Ta and W from the western North Pacific Ocean have been determined using solid-phase extraction method coupled with ICP-MS. 8-hydroxyquinoline (8HQ) bonded covalently to a vinyl polymer resin, TSK-8HQ [1], was used in a chelating adsorbent column to concentrate the metals. The most advantage of this resin is its endurance to 5 M HF, since it is the effective eluent for the five metals.

Seawater samples were collected during the cruise of R/V Mirai MR05-01 using a CTD carousel, on which Niskin-X samplers were mounted. The interior of the samplers was coated with Teflon and cleaned with detergent and HCl. Immediately after sampling, filtered and unfiltered seawater samples were acidified by 10^{-2} M HCl and 2×10^{-3} M HF for preservation. Zr, Hf, Nb, Ta and W in 250 mL seawater sample were extracted using a column of TSK-8HQ resin and eluted with 20 mL of 5 M HF. Eluate then evaporated to dryness and the metals were re-dissolved in 5 mL of 0.5 M HNO₃. Concentrations of the metals in the solution were determined by ICP-MS (Elan DRC II, Perkin Elmer).

At station KNOT (44N, 155E) in the North Pacific Ocean, the concentration range of dissolved Zr, Hf, Nb, Ta and W are 48-269, 0.19-0.92, 4.1-6.7, 0.07-0.21 and 39-50 pmol kg⁻¹, respectively. The ratio range of Zr to Hf is 237-385 and Nb to Ta is 32-61 which is higher and more variable than continental crust. We will report the vertical profiles of these metals from other stations in the western North Pacific Ocean at the presentation.

References

[1] Dierssen H., Balzer W. and Landing W.M. (2001) *Mar. Chem.* **73**, 173-192.