

The Concentration Levels of Heavy Metals in Seawater of Hiroshima Bay in the Seto Inland Sea, Japan

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With the increases of industrial and social activities, as the evidence that the industrial and domestic effluents have been flowed into the estuaries, the concentrations of heavy metals in the coastal seawater have been increasing. As a result, the organisms in the estuaries are reducing. Because of the requirement of monitoring these phenomena, we have been studying the concentration levels of heavy metals in the seawater of Hiroshima Bay, in the Seto Inland Sea, Japan. Seawater samples were collected in 5 or 10 l Niskin and/or Go-Flo bottles by TY-99-2 cruise in June 1999 by Toyoshio-maru, Faculty of Applied Biological Science, Hiroshima University. The seawater samples were immediately passed through 0.4 μ m Nucleopore filters on ship. The concentrations of heavy metals in the seawater were determined by the on-line column preconcentration/inductively coupled plasma-mass spectrometry (ICP-MS). From both the analytical results and horizontal and vertical distributions of Al, Zn, Mn, Cd, Pb, Cu, Ni, Co, V, Mo and U, the distribution patterns of metals are divided into three groups: (1) heavy metals due to the terrestrial inputs; Al, Zn, Mn, Cd and Pb; (2) elements due to the sea source, Mo and U; (3) elements which are not distributed in the distinct profiles: Cu, V, Ni and Co. The concentrations of Al, Zn, Mn, Cd and Pb in the inner part of the bay are very high and 5.0-16.8 times higher than those in the mouth of the bay (Fig.1). The concentration levels of heavy metals and rare earth elements (REEs) in the seawater of Hiroshima Bay are compared with those in the seawater of the North Pacific Ocean (Fig.2). We must continue to monitor the concentrations of heavy metals in the coastal seawater and their effects on the organisms.

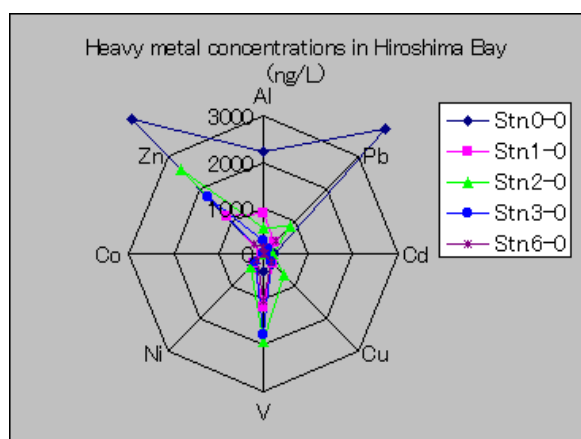


Fig.1 The concentrations of heavy metals in seawater of Hiroshima Bay, in the Seto Inland Sea, Japan.

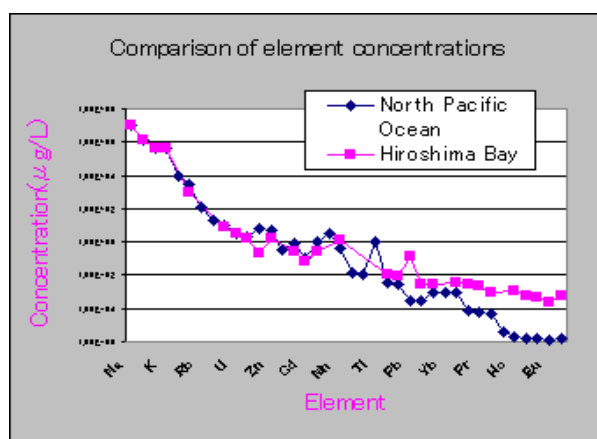


Fig.2 The comparison of concentrations of elements between the North Pacific Ocean and Hiroshima Bay.