Iodine speciation and iodine-129 distribution in the Chukchi Sea and Bering Sea

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Iodine is a biophilic element in the ocean and accumulated in marine planktons and macroalgaes. However, its biogeochemical cycles have not been fully clarified in the ocean because of its complicated speciation. Iodine mainly exists as iodate, iodide and organic iodine in seawater. It is important to study the speciation of iodine in seawater because each chemical form of iodine has very different reactivity. In this study, we have investigated the chemical speciation of iodine in seawater of the Chukchi Sea and Bering Sea. Moreover, we revealed the distributions of iodine-129 in seawater, which is a good tracer for anthropogenically released iodine to the marine environments.

Seawater samples were collected with Niskin-X samplers deployed onto CTD-CMS at the continental shelves of the Chukchi Sea and Bering Sea during Oshoro Maru C255 cruise (14 June – 6 August, 2013). Samples for speciation analyses were frozen, stored and brought back to AORI, Tokyo. Iodine speciation were analyzed by cathodic stripping voltammetry [1]. Iodine-129 in seawater was determined with an accelerator mass spectrometry after solvent extraction [2].

Iodide concentrations in seawater often increased toward the seafloor bottom, which indicates the iodide is released from the sediments of the continental shelf. The highest organic iodine concentration (176 nM) was found in the bottom water at the shelf. Concentrations of iodine-129 ranged from 0.79 to 2.89 (10^7 atom/L) in the Bering Sea, which is lower than those reported in 1993 [3].

[1] Campos (1997). *Marine Chemistry* **57**, 107–117. [2] Suzuki and Muramatsu (2005), *Radioisotopes*, **54**, 51-53. [3] Cooper et al. (2001), *Marine Pollution Bulletin*, **42**, 1347-1356.