Tracing the iodine source of marine biota using iodine 129 isotopic ratio

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Recent surface environment has been poluted by anthropogenic iodine 129 (^{129}I, HL = 15.7 M year) released by human nuclear activities, e.g. nuclear bomb testings and nuclear fuel reprocessing. Since stable iodine 127 (^{127}I) exists equilibrum condition, the isotopic ratio of ^{129}I and ^{127}I (^{129}I/^{127}I ratio) clearly changes when the anthropogenic ^{129}I is released into the environment. In the ocean, the highest ^{129}I/^{127}I ratio, 10^{-8}-10^{-6}, was observed in the European North Sea. This anthropogenic ^{129}I was resulted by direct discharge of ^{129}I from nuclear reprocessing plants [1]. On the other hand, in the Pacific Ocean, far from the currently active source, resulted the ^{129}I/^{127}I ratio of 10^{-11} – 10^{-9} [1]. In this area, ^{129}I was transported through the atmosphere. These obvious differences of ^{129}I/^{127}I ratio in seawater mean ^{129}I/^{127}I ratio of seawater identifies the ocean area.

It is not well-understood the iodine source of marine biology although iodine is known to be a biophile element. ^{129}I/^{127}I ratio of ocean biota would depend on that of seawater in the habitat environment. Therefore ^{129}I/^{127}I ratio has potential to be a tracer of ocean biology. In this work ^{129}I/^{127}I ratio in biological samples and seawater samples collected at the Western Pacific Ocean were measured and compared to verify the relationship of ^{129}I/^{127}I ratio between marine biota and seawater.

Reference [1] P. He, A. Aldahan, and X.L. Hou (2013) *NIMB* **294**, 537-541.