The concentration and migration of iodine-129 in the ocean released from the accident of the Fukushima Daiichi Nuclear Power Plant

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Introduction

Iodine-129 (T1/2=1.57x10^7 years) is natural occurring radionuclide and have been released by the atmospheric weapon testing and the operation of spent nuclear fuel reprocessing plants.

To evaluate the influence of the accident of Fukushima Daiichi Nuclear Power Plant (1F), it is necessary to understand the level of 129I before the accident. Since the level of 129I in the western North Pacific Ocean were reported, we discuss the released 129I by the accident based on the situation before the accident.

Accident-derived 129I in surface seawater

The concentrations of 129I after the accident were reported 1-5. The result of surface seawater reported by Suzuki et al., 2013 1 are introduced. The concentrations at almost all the stations shown in Fig 2 are higher than that before the accident shown in Fig 1. These results indicate that 129I was released by this accident.

Accident-derived 129I in deep layer

The depth profiles of 129I after the accident were reported 1-6. The result of depth profiles reported by Suzuki et al., 2018 6 are introduced. The concentration of 129I had increased in surface mixing layer at Oyashio and Transition area. At Kuroshio area, 129I rich layer was found around 400 - 500 m water depth. The Kuroshio Extension was meandering when the seawater sampling shown in Fig 5. A southern current from transition area occurred by the influence of the meander and it was subducted under the Sweater of the Kuroshio current area.

Conclusion

The accident-derived radionuclide is useful for not only understanding the movement of radionuclides but also investigating the seawater mixing in oceanographic studies.

References