

Measurements of atmospheric mercury concentration at remote islands, western Japan

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Asia continent contributed about 50% of the global anthropogenic mercury (Hg) emissions, while China alone contributed about 30%. Therefore, much amounts of Hg are estimated to transport and deposit to Japan in the lee of East Asia. UN Environmental Program (UNEP) required to reduce Hg emissions into environments and its health risk. Therefore, the global partnership was established by six countries including Japan in 2006 in order to encourage atmospheric Hg study at remote areas including high mountainous and polar ones and on long-range transport in the atmosphere. However, atmospheric Hg monitoring and deposition is not studied at all on remote areas of high mountains and islands in Japan. In the present study, we report to monitor atmospheric Hg and related pollutants at the remote islands (Tsushima, Yakushima and Okinawa Islands), western Japan in order to reveal atmospheric Hg variations and acquire observational data to depositional and transport model.

We began to continuously determine atmospheric Hg with using mercury monitors (Mercury Instruments Inc., UT3000) at the Korea view point in northern Tsushima Island and Isso Junior High School in northern Yakushima Island since 2011. We also determined atmospheric Hg with using gold beads into quartz tubes on an active sampler without commercial electric power at near the summit of Mt. Fuenchidi, northern Okinawa Island. We have determined atmospheric ozone and sulfur dioxide with using ozone monitors and sulfur dioxide monitors at Tsushima and Yakushima Islands, too. Atmospheric Hg concentrations ranged from 0.1 to 1.5 ng m⁻³, which were the same level or less than back ground level, at these sites. There was showed no diurnal variations, and sometimes spike-likely high concentrations more than 1 ng m⁻³.

We will also present atmospheric ozone and sulfur dioxide concentrations and variations at the islands with atmospheric mercury concentrations.

Keywords: atmospheric mercury, remote islands, Tsushima Island, Yakushima Island, Okinawa Island