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北西太平洋上の大気中水素濃度観測
Atmospheric hydorogen mesurements in the western North Pacific

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Molecular hydrogen (H_2) plays a significant role in global atmospheric chemistry due to its role in CH_4 -CO-OH cycling and water vapor source in the stratosphere. The balance of H_2 could change with the implementation of a new H_2 energy carrier. Therefore, it is important to establish its global budget and atmospheric trend (WMO/GAW Report No.197, 2011).

We started atmospheric H_2 measurement at Minamitorishima (MNM) from Nov. 2011. The measurement system using a GC-RGD (gas chromatographs equipped with a reduction gas detector) was installed for sirmulteneouse analyses of H2 and carbon monoxide at 3 stations of MNM, Yonagunijima (YON), and Ryori (RYO) operated by Japan Meteorological Agency (JMA). In this study, high-precision H2 standard gases are prepared to determine the atmospheric concentrations from the output signal of the GC/RGD.

The H_2 concentrations at MNM varied seasonally from 490 ppb to 560 ppb with a yearly mean of about 520 ppb. The H_2 variations often show distinct episodic events with enhanced concentrations on a synoptic scale in winter. This result indicates that H_2 increases are caused by the long-range transport of Asian polluted air masses to the station, suggesting that H_2 is a good tracer for identifying continental air masses in winter season. On the other hand, the H_2 concentrations are higher and stable in summer season. This result indicates that the maritime air masses are dominated, and the influence of soil absorption was small.

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