Acid rain in Miyakejima Island collected at the study sites of PWRI

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Hydrological observations have been performed in the slopes of Miyakejima Volcano by PWRI (Public Works Research Institute). The total volume of precipitation during each observation interval was measured using the plastic bottle for the purpose of verifying the data of the rain gauge. Concentration of the major chemical compositions of the rainwater in the bottle was analyzed in AIST.

The rainwater has been collected once a month since August 2003. The collection bottles were equipped at the 8 study sites located in the east and south slope of the volcano. The capacity of the bottle and the diameter of the funnel were 20 litters and 18 cm, respectively. Especially in the east slope, the 5 bottles were located linearly from the crater to the coast. The distances from the edge of the crater were 600, 800, 1400, 2100 and 2500 m.

As the results of the analysis, pH of the all rainwater was less than 5.6, showing acid rain. The main component of the rainwater was sulfate or chloride ion. A large amount of volcanic gas has emitted from the crater of the volcano since 2000. Especially the flux of SO2 gas was measured to be from 3000 to 10000 t/day in 2003 and 2004 by JMA. We observed that the sulfate-ion concentration of the rainwater decreased spatially in the east slope as the distance from the crater increased. Thus the main source of the sulfate ion was thought to be sulfur included in the volcanic gas. The maximum concentration of the sulfate ion, 5600 mg/L was observed at the second site in the east slope on July 2004, although the rainwater might partially evaporate. Even if the maximum value was eliminated, the average concentration of the sulfate ion at the site was 110 mg/L until November 2004.