Possibility of the large-scale hydrothermal alteration zone (Bosei-site) observed around the northern part of outer-rim of Sumis caldera, Izu-Ogasawara Arc

*Izumi Sakamoto[1], Koharu Matsushita[1], Yuta Shinomiya[1], Masatoshi Yagi[1]

1. School of Marine Science and Technology, Tokai University

There are some submarine calderas on the volcanic front of Northern Izu-Ogasawara Arc. Volcanic massive sulfide deposits were reported from some of these caldera. Geological and bathymetric investigations with acoustic water column anomalies survey were carried out around the Smith caldera, in 2016. Plural small mounds and spur were confirmed as a geographic characteristic on north side outer rim of a volcanic crater. And also it was confirmed a plural number acoustic water column anomalies in a range of approximately 5km.By the dredge sampling around the outer rim area where underwater acoustic water column anomalies was observed, a large quantity of volcani-clastic rocks were sampled. All of these rocks are lapilli stone and lapilli tuff samples, and these rocks were subjected to conspicuous alteration which generally caused them to turn reddish and sinter developed in a rock margin. We performed microscopy and X-ray diffraction analysis to examine the origin of the red material, but the iron related material was not detected. However, by the quantitative analysis result of these sinter matrix, Fe_2O_3 more than 60wt.% was confirmed at the maximum. Needles of cristobalit are dispersed throughout in the vesicles of lapilli stone. So, we estimate that the low-temperature hydrothermal activity happens in a northern outer rim of Smith caldera area. Judging from distribution of acoustic water column anomalies and dredge sample, the scale may happen in a wide area of approximately 5km in northern rim of Smith caldera.

Keywords: hydrothermal alteration zone, Submarine caldera

