Geological feature of seafloor polymetallic sulfides at the Duanqiao hydrothermal field (Southwest Indian Ridge)

WEIFANG YANG[1], CHUNHUI TAO[1, 2], SHILI LIAO[1],JIN LIANG[1], JIA LIU[1], WEI LI[1]

[1]Key laboratory of Submarine Geosciences, Second Institute of Oceanography, Ministry of Natural Resources, Hangzhou 310012, China

[2] Shanghai Jiao Tong University School of Oceanography, Shanghai 200030, China

Seafloor polymetallic sulfides in the mid-ocean ridges may provide some metals of interest to the mining industry (*e.g.* Cu, Pb, Zn, Ag, Au, As). Due to the super-slow spreading, the Southwest Indian Ridge has become a research hotspot. The Duanqiao hydrothermal area is suited between the Indomed and Gallieni fracture at a central volcano on the Southwest Indian Ridge. Previous studies had suggested that the presence of partial melt accompanied by an unusually thick crust(~9.5km).

Until now, there are so many investigate work aimed at this area including the offshore photographic tow, the TV garb, the shallow drilling cores, “Qianlong II” AUV probe and the manned submersible probe. Based all the investigate work, the sulfide distribution and the scale of this mineralization can be well known. It suggested that the distribution of sulfides in the Duanqiao mineralization area is uneven, mainly consisting of two sulfide deposits, of which the largest area is in the southeastern part. About 100 m to the right of the sulfide deposit, there is also a large sulfide deposit. On the periphery of these two sulfide deposits, there are many other scattered sulfide deposits. Affected by hydrothermal activity, the surrounding rocks are often altered, mainly showing yellow-green altered basalt breccia. Taking the largest sulfide deposit as an example, it mainly contents sulfide mounds ang the sulfide breccias, the hydrothermal sediments are rarely or even absent. Previous investigations show that no active chimney has been found in this area. However, near-bottom observation and geological sampling of manned submersible confirm the recent occurrence of hydrothermal activity in this area. Compared with other mineralization areas of SWIR, a lot of siliceous samples such as opals have been collected in the Duanqiao mineralization area, indicating the low-temperature hydrothermal activity in the area.