

HYDROTHERMAL PROCESSES IN OCEANIC ULTRAMAFIC ENVIRONMENTS: THE RAINBOW HYDROTHERMAL SULFIDE DEPOSIT

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Detailed mapping and sampling were conducted with Nautille on the Rainbow site during 4 cruises in 1997 (Flores, Marvel cruises), and 1999 (Pico and Saldanha cruises). After several surface cruises to study the plume the site was located on the seafloor during the Flores cruise (July 1997). The active vent field (36°13,80N, 33°54,12W) is on the western flank of the Rainbow ridge at water depth between 2270 and 2320m, and covers a surface of 250 m x 60 m. The principal originality of the site is its location on serpentized ultramafic rocks; the lack of fresh basalt close to the vents, and its control by faults from a non transform offset of the ridge. Ten groups of extremely active black smokers are dispersed over the entire field. The western border of the field is a 25 m high fault scarp where stockwork mineralisation is observed. Fluid collected have a maximum temperature of 362°C and are extremely enriched metal and gas particularly hydrogen (Charlou et al., 1997). Sulfides are enriched in Cu and Zn when compared with other sites in basaltic environments and comprises specific Co, and Ni minerals.