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MINERALS ABSTRACTS

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Polymetallic Sulfide on East Pacific Rise Between Latitude 21°N and 21°S

Sulfide deposits and hydrothermal activity have been studied by Ifremer along the East Pacific Rise during numerous surface and diving cruises between 1978 and 1985 in several areas: lat. 21°N, 13°N, 17°30'S, 18°30'S, 20°S, and 21°30'S. Although the sulfide mineralogy and geochemistry are similar in these zones, the proportion of the different paragenetic associations is variable. Deposits occur in two main locations: on the ridge or on seamounts within a few kilometers of the ridge axis. The largest deposits are localized on seamounts where hydrothermal activity is likely to be focused in space and time. In contrast, the small deposits on the axis are scattered along several kilometers. The most extensive deposit on the East Pacific Rise occurs at lat. 13°N, on the flank of a seamount 6 km off the axis. This single sulfide lense is estimated to be 800 m long, 400 m wide, 10 m thick in places, and to contain between 2 and 5 million MT of sulfide. However, the total mass of more than 100 small deposits on the axis at lat. 13°N does not exceed 100,000 MT. The size of the largest sea-floor deposits is similar to that of single lenses that are mined in fossil volcanogenic massive orebodies on land, such as Cyprus type and Kuroko type. An important difference between fossil deposits on land and present-day sea-floor deposits is that the latter are still growing. Thus, sulfides deposits on the East Pacific Rise are at different stages of maturity depending on their position in the volcano-tectonic cycle, and maturity, paragenesis, and geochemistry of deposits are related.