

Massive Sulphide Deposits of the Central Jebilet Massif, Morocco

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The Central Jebilet massif, in the Marrakech region of Morocco, comprises a block of Carboniferous sedimentary rocks that were extensively deformed and metamorphosed during the Variscan orogeny. This block, and its extension to the south of Marrakech (the Guemassa massif), are characterised by bimodal intrusive magmatism and abundant massive sulphide deposits that represent a major Cu-Pb-Zn resource. Mining is currently taking place at the Draa Sfar and Hajjar mines. Previously worked deposits at Kettara, Roc Blanc and Koudiat Aicha are not currently being exploited, but have extensive reserves remaining, and prospects such as Laachach and Ben Slimane are being explored.

The massive sulphide deposits of the Central Jebilet have generally been assigned to the Volcanogenic Massive Sulphide (VMS) deposit class. They have some characteristics typical of VMS systems, although many original relationships are obscured by extensive Variscan deformation and greenschist facies metamorphism. Notably, extrusive volcanic rocks are rare within the metasedimentary sequence of Central Jebilet, which is dominated by pelitic schists with subordinate metasediments and metalimestones. The massive sulphide deposits form steeply dipping lenses that are elongated parallel to the regional schistosity, and commonly associated with shear zones. Their surface expression is typically marked by narrow gossanous zones (10-100 m in width), but the deposits extend vertically and laterally for several hundred metres to kilometres. The majority of the massive sulphide lenses are dominated by pyrrhotite, although many have later phases of sulphide deposition that are characterised by pyrite and chalcopyrite. The pyrrhotite-rich bodies typically show evidence of ductile deformation and remobilisation, whilst the later phases of sulphide deposition appear to post-date the main deformation phase.

There are currently two hypotheses for the formation of the Central Jebilet massive sulphide deposits: (1) they are syngenetic, representing either classic VMS or SEDEX mineralisation [1,2]; or (2) they are epigenetic, formed during the waning stages of Variscan orogenesis and associated with the bimodal intrusive magmatism in the area [3,4]. This talk will provide an overview of the metallogenesis of the region, illustrated with case studies from the Draa Sfar and Kettara deposits.

References

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