Copper in the Guiana Shield

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Two types of copper deposits predominate in the rainforest-clad Guiana shield. Volcanogenic deposits associated with orogenic-type gold mineralisation are concentrated in the Paleoproterozoic Maronian greenstone belt stretching over 1,500 km along the Atlantic coast of South America. Mafic to felsic volcanism, plutonism, sedimentation, deformation, and hydrothermal mineralisation essentially took place during the Trans-Amazonian Orogeny, 2.26-2.03 Ga, the equivalent of the Eburnean Orogeny in the Birimian of West-Africa. Copper sulfides, especially chalcopyrite, bornite, chalcocite, and covellite, are minor but characteristic constituents of hydrothermal gold-bearing quartz veins, stringers, breccias, and disseminations in greenschist-facies metavolcanic rocks in Las Cristinas, Venezuela, Toroparu and Million Mountain in Guyana, and amphibolite-facies schists, BIFs, and carbonate rocks in the Tucano-Urucum gold deposit in Amapá, Brazil. The Montagne d'Or gold deposit in French Guiana contains four zones of stratabound sulphide disseminations, stockworks, and veinlets in which chalcopyrite is the main copper mineral. This deposit is informally considered an Au-rich VMS.

The second type comprises two unusual copper deposits without gold in high-grade metamorphic terrains in the interior of Suriname. In the UHT metamorphic Bakhuis Granulite Belt (2.09-2.03 Ga), copper and apatite mineralizations are associated with migmatitic granulites, calcsilicate granulite, metagabbros, and ultramafics. Bornite and chalcopyrite occur disseminated in the leucosome of the migmatitic rocks, and apatite beds are concentrated in calcsilicate granulites. An evaporitic origin for the phosphate deposits has been suggested.

The Weko Sula deposit in southeastern Suriname (2.06 Ga) forms a pluton-like body in the diatexitic southward extension of the greenstone belt and consists of plutonic-looking rocks composed of abundant large euhedral cordierite crystals with some plagioclase, and interstitial aggregates of coarse magnetite, apatite, biotite, and copper minerals, mainly bornite, chalcosite, and covellite. It is thought to result from anatexis of Kupferschiefer-like sediments, though the magnetite-apatite association also reminds one of Kiruna-type deposits.