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## **Bacteriogenic and magmatic S sources in the Cabildo Cu District (Chile)**

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“Manto-type” Cu-(Ag) deposits, the third main source of Cu in Chile, have a controversial genesis (magmatic vs. metamorphic and syn vs. epigenetic models [1]). These deposits are hosted in Jurassic to Lower Cretaceous volcano-sedimentary rocks on the Coastal Range. The Cabildo district (lat 32°30'S; long 70°55'W) is unique in that “Manto-type” Cu-(Ag) and Cu (Mo)-skarn deposits coexist. The  $\delta^{34}\text{S}$  range of Cabildo “Manto-type” sulphides is extremely wide (-30.8 to + 16.9‰). In contrast, in the Cu-skarn sulphides the same range is very homogeneous (-3.2 to -1.5‰). However, the  $\delta^{34}\text{S}$  range of sulphides from the Mo-bearing skarn zone differs from the rest of the skarn showing more depleted values (-8.6 to -5.6‰).

A two-stage mineralization process in “Manto-type” deposits is proposed: 1) Bacteriogenic pyrite formed during an early diagenetic stage in a semi-closed system. 2) S remobilization and Cu input in a low metamorphic environment to produce bornite-chalcopyrite ores. The skarn formation could be coeval or at least close in time to the second mineralization event of the “Manto-type” deposit. The S source for Cu- skarn mineralization is dominantly magmatic. Nonetheless, a contribution of bacteriogenic S in the Mo-rich skarn zone also appears likely.

Supporting this hypothesis, further isotopic analysis  $^{87}\text{Sr}/^{86}\text{Sr}_0$ , C and O show two main sources of metallogenic fluids in the area, low-grade metamorphic fluids (which leach limestone with bacteriogenic pyrite) and magmatic fluids, with intermediate isotopic signatures (and sources) for Mo-rich skarn.

[1] MaksaeV & Zentilli (2002) *PGC Publishing, Adelaide*, 185-205.