

## Mineralogy, Geochemistry, and Age Constraints on the Zn-Pb Skarn Deposit of Maria Cristina, Quebrada Galena, Northern Chile

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### Abstract

The Maria Cristina Zn-Pb skarn deposit, hosted by carbonate rocks of the Lower Cretaceous Chañarcillo Group in northern Chile, is described to provide a basis of comparison to adjacent (~2 km) barite deposits and regional Pb-Zn and Ba deposits with Mississippi Valley-type affinities. Strongly retrograded garnet (andradite to Ad<sub>30</sub>Gr<sub>70</sub>), diopsidic pyroxene, and epidote skarn, and baritebearing massive sulfides (sphalerite-pyrite-galenamarcasite- magnetite) occur at the contact of potassically altered diorite porphyry of mid-Cretaceous age. The skarn mineral compositions, similar to those of Cu skarns, may reflect emplacement in a high  $f_{O_2}$  context. Sulfur isotope values of sulfides (-8.8 to +7.1‰) and barite (14.0-26.1‰) indicate disequilibrium conditions and different sulfur sources, including magmatic sulfur. Lead isotope ratios of galena and strontium isotope ratios of barite indicate a similar metal reservoir for the different ore deposit types, constituted by the intercalated Lower Cretaceous volcanic rocks or mid-Cretaceous intrusive rocks. <sup>40</sup>Ar/<sup>39</sup>Ar dating of hydrothermal K feldspar suggests an age between 94 and 90 Ma for the mineralization.