

# **FLUID EVOLUTION AT THE LA JOSEFINA EPITHERMAL Au DISTRICT, MACIZO DEL DESEADO, SOUTHERN PATAGONIA, ARGENTINE.**

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La Josefina Au-Ag epithermal deposit is located in Jurassic Macizo del Deseado volcano-sedimentary complex. In the present work mineralized vein formation fluids and dominant mineral stability conditions during its percolation have been studied. Primary fluids of aquo-saline composition (without nitro-carbonic phases) have been identified. The oldest fluids related to the initial mineralizing stages (gold, adularia, tetrahedrite, galena and early quartz generations) presented salinity up to 15 wt% NaCl equivalent and temperatures near 250°C. On the other hand, late primary fluids related to hematite precipitation and latest quartz generations presented lower salinity (<6wt%NaCl equivalent) and temperatures near 200°C. During the vein formation oscillating pH values (between 5.5 and >6) and O<sub>2</sub> activities (varying from 10<sup>-33/-34</sup> to 10<sup>-31/-32</sup>) have occurred. Gold must have precipitated as a consequence of boiling process at pressures near 50 bars. Adding to the log[fH<sub>2</sub>/fH<sub>2</sub>O]~2.9 value the type of mineralization (gold-elektum-tetrahedrite), the small sulfide abundance, presence of adularia, range of salinities and temperatures and evidences of fluid boiling indicate the La Josefina district as one of low sulfidation type deposit.