# Mineralogical and chemical studies of ore deposits collected from Valu Fa Ridge, Lau Basin

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Mineralogical and chemical composition of the ore samples collected from Mariner Field, Valu Fa Ridge was studied. We classified three types based on the dominant mineralogical composition; Type-A: rich in chalcopyrite and pyrite, Type-B: rich in sphalerite and barite, Type-C: includes isocubinite. Sulfur fugacity was estimated based on FeS and CuS contents in sphalerite, which were determined by EPMA analysis. Type-A and Type-C ores show sulfur fugacity in the range from $10^{-8}$ to $10^{-6}$, while Type-B shows in the range from $10^{-10}$ to $10^{-8}$. Because Type-B ores were found in the smokers which venting temperature was rather low (around 250degree), the low sulfur fugacity would be attributed to mixing between the hydrothermal fluid and seawater prior to the venting. We confirmed accordance between the estimated fluid temperature and sulfur fugacity, and the mineral compositions of the ores samples in a Cu-Fe-S diagram.