

Chlorine isotope fractionation recorded in atacamite during supergene copper oxidation

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© 2019 In the Atacama Desert of northern Chile, large amounts of the copper hydroxy-chloride mineral atacamite ($\text{Cu}_2\text{Cl}(\text{OH})_3$) are formed in the supergene oxidation zone of Cu deposits. Since atacamite requires saline water to form and is commonly preserved under hyperarid conditions, it has been proposed as a climate-sensitive mineral marker that can also provide relevant geochemical information regarding halogen (in particular chlorine) fluid sources during supergene Cu oxidation. However, chlorine stable isotope data for atacamite in Cu deposits are scarce and no experimental data for chlorine isotope fractionation between atacamite and water are currently available that could provide constraints on the possible mechanisms of fractionation. In this study we report $\delta^{37}\text{Cl}$ values of atacamite along a thick (~100 m) and well-developed supergene enrichment profile at the Barreal Seco iron oxide-copper-gold (IOCG) deposit in the Atacama Desert. The $\delta^{37}\text{Cl}$ values of atacamite along this profile