

### **Statistical Analysis of Geochemical Data from In-Bearing Mineralization in the Marta Centro Vein, Pingüino Deposit, Patagonia, Argentina**

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Indium is a critical metal due to its growing demand in modern technologies such as photovoltaic cells and high-resolution displays, contrasted by its limited global production. Although typically scarce in epithermal environments, indium has been found in notable concentrations within base metal-rich polymetallic and intermediate sulfidation epithermal systems. The Pingüino deposit, situated in the low sulfidation epithermal metallogenic province of the Deseado Massif, Patagonia, Argentina, represents a unique case in the region due to its atypical indium enrichment. Mineralization at Pingüino occurred in two distinct events: an early polymetallic event enriched in In, Zn, Pb, Ag, Cd, Au, As, Cu, Sn, W, and Bi characterized by a complex sulfide assemblage; and a later Ag–Au intermediate sulfidation event. The early event, which is the focus of this study, has been classified as an In-rich polymetallic epithermal vein system.

This work presents a statistical analysis of geochemical data from In-bearing mineralization in the Marta Centro vein, where indium displays its highest concentrations within the Pingüino deposit. Exploratory analysis revealed several relevant patterns and features. Significant anomalies were observed in elements such as In, Ag, Pb, Zn, Cd, and Sb. Correlation coefficients and binary diagrams indicate strong relationships between In–Sn, Au–Ag–Cu–Sb–Sn, Ag–Cu–Pb, and Zn–Cd.

These results help to provide valuable insights into the processes controlling indium enrichment and contribute to the development of exploration strategies for critical metals in polymetallic epithermal systems.