

Presence of Vanadium in Epithermal Systems of Patagonia, Argentina

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Vanadium has been considered a critical raw material by the European Commission since 2017 (Critical Raw Materials 2017 list) due to its economic importance and the high risk in its supply. The sustainable supply of this element is essential for the industry, as it is used in the steel industry (as an alloy for the manufacture of wind turbines, with aeronautical and space applications), and for its role in the transition towards clean energy (vanadium-based redox flow batteries). Vanadium is primarily extracted from V-Ti magnetite deposits as a co-product of iron. Also, it is recovered as a by-product in U-hosted sandstone deposits, or as a primary product in vanadate deposits and carbonaceous shales. The La Luz deposit, located in the Somoncurá massif, Patagonia Argentina, represents an epithermal deposit, composed of a 7-km NE and NW quartz-carbonates vein system, with widths up to 3 m. The main minerals identified are galena, sphalerite, malachite, chrysocolla, and native copper in quartz-calcite-rhodochrosite gangue. Surface samples analyzed (ICP on ore minerals) show high anomalies of gold, silver, lead, copper, and zinc and the presence of high values of vanadium (up to 1,455 ppm) associated with indium (up to 310 ppm) and gallium (up to 149 ppm). A positive correlation between Pb-V is observed, which could be related to the presence of some lead vanadate such as vanadinite. On the other hand, indium shows a good correlation with Cu. The determination of these anomalies in surface samples represents high potential at depth. The presence of these metals, mainly V, is relatively rare in this type of deposit and represents a discovery in the region. This assemblage increases the mining potential and must be considered during future exploration duties. More detailed studies are underway to determine the distribution and presence of these critical elements in this deposit.