

INTRODUCING THE THIRD FORCE IN METALLURGY

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ABSTRACT

To provide a much-needed hedge against the rising social costs of air, soil and water pollution, the HOLY GRAIL for critical precious and base metal recoveries is to:

- a) remove toxic pollutants;
- b) lower energy consumption;
- c) reduce water use;
- d) deliver high metal recoveries;
- e) deliver fast kinetics; and
- f) return any waste back into the Circular Economy.

The industry needs to adopt transformational technologies which meet these lofty industry ambitions and address the significant energy and toxicity shortcomings plaguing both the hydrometallurgical and pyrometallurgical metal extraction methods.

The ground-breaking work at Vinca Technologies offers such a solution, by applying chlorides in their molten state to cleverly act as both a lixiviant and as an electrolyte. In so doing, they enable homogeneous processing features capable of capturing multiple critical precious and base metals simultaneously within a single non-toxic, non-aqueous leach and electrodeposition circuit, without the need for ultra-fine grinding; toxic lixivants or ultra-high temperatures.

Best of all, the Vinca process consistently achieves outstanding recovery results from both oxide and sulphide (*single and double refractory*) hosted polymetallic orebodies, in the range of 90-99+%, and is suitable for recovering Au, Ag, Pt, Pd, Rh, Ru, Co, Cu, Ni, Pb, Zn. Reaction kinetics are rapid, while the spent salts are regenerated, and the gangue re-useable as construction aggregate.

Our paper will present the key technical and economic advantages of the Vinca process, as well as its flowsheet steps in detail, while highlighting why this innovative process is the game-changing chloride solution the industry has long been seeking.

Keywords: Vinca, 3rd Force in Metallurgy, Critical metals, gold, silver, PGMs, cobalt, copper, nickel, Molten chloride salt, Polymetallic orebodies