

SPECIATION ASSAYS FOR NI AND CO ORES

By

Mining and Process Solutions Pty. Ltd.

Presenter and Corresponding Author

Frank Trask, MSc, MAIG, Technical Director

ABSTRACT

Co (Group IX) and Ni (Group X) are metals commonly associated with sulphides that occurs within mafic and ultramafic rocks, and in the non-sulphide portions of these rocks that have been weathered sufficiently to concentrate either of the two above metals enough to form laterite or residual deposits. The further occurrence of cobalt in both copper sedimentary deposits and the IOCG deposits is also described.

A series of speciation assays for each element is defined, and the use of these assays is considered. Tables are presented that make the meaning of the assays clear. The various analytical procedures will be discussed, and the implications for both Ni and Co being included in the water soluble, the dilute acid soluble, the peroxide/ascorbic acid soluble, the SO₂ soluble, and the 4 acid soluble classifications made clear. The purpose of the assays is to guide process selection for these ores.

MPS will also consider the relationship between various speciation assays and the availability of specific metal anions to the various glycinate species. The use of the assays to classify ores into treatment groups is considered, and some examples are given.

MPS now have analytical chemistry capabilities within their Process Development Laboratory, and one of its principal importance for the future is to constantly work on development of speciation assays to help in the understanding of treatment selection for ore bodies.

Keywords: Speciation assays, Nickel Ores, Cobalt ores, Analytical procedures, Glycinate species, Treatment selection