Base Metal Leaching
Mineralogy Services
Introduction

ALS Metallurgy is part of the ALS Group, a diversified and global analytical laboratory and testing services company.

ALS Metallurgy is the global leader in metallurgical testing and consulting services for mineral process flowsheet development and optimisation.

Extensive bench scale laboratory, large scale pilot plant facilities and expert metallurgists, provide mineral processing, hydrometallurgical, mineralogical and in-plant services to the global resources community.

Our metallurgical solutions are internationally recognised by the mining, engineering and financial sectors for all major commodities:

- Precious metals - gold, silver, platinum group metals
- Base metals - copper, cobalt, lead, zinc, molybdenum, manganese
- Iron ore - hematite, magnetite, goethite, itabirite
- Nickel - laterite & sulphide ores
- Uranium & thorium
- Rare earth minerals & other exotics
- Mineral sands
- Industrial minerals
- Tungsten & tin

ALS Metallurgy has an enviable reputation for delivering the highest quality extractive metallurgical testing service with accurate and timely data, expert support and a culture of safety and innovation.

Core Values

Our Core Values are simple and we incorporate these in our daily operations, never forgetting the foundations of our success:

- Honesty and Integrity
- Exceeding Client Expectations
- Belief in our Ability
- Hard Work and Continuous Improvement
- Doing it Better
- Celebrating Success
- Safety as a Priority.
Base Metal Leaching

Know your ore...
A thorough understanding of the mineralogical composition of an ore is critical when using hydrometallurgical processes to extract Cu, Ni, Co and other base metals from ores.

Process mineralogy forms an integral part of the economic and technical evaluation of such a deposit and, when done throughout the life cycle of the mine, will continue to assist with the identification of process improvement opportunities.

...especially if it is from a complex or low grade base metal deposit
Deposits currently being considered for exploitation are becoming increasingly more complex and, in response, so are the extractive metallurgical processes.

It is therefore critical to obtain information on all factors that might affect eventual profitable mining and processing of the deposit.

This is especially important in the case of:
• Complex and/or highly variable ore bodies
• Low grade ores such as nickel laterites
• Ores containing high proportions of deleterious minerals and/or elements

Understanding the mode of occurrence of the value elements as well as any deleterious elements and minerals in these ores is critical to achieving optimum extraction of the base metals from the ore and therefore maximizing profitability.

We can add value throughout the life cycle of your iron ore project...
• Exploration
• Prefeasibility studies & feasibility studies
• Resource & reserve determination
• Geometallurgy
• Mine planning & production scheduling
• Extraction process design & optimisation
• Pilot plant testwork support
• Plant control & troubleshooting
• Plant audits & monthly surveys
• Smelter management
• Environmental assessment programmes
• Mine rehabilitation

Benefit from the integration of our services
ALS Metallurgy’s experts integrate quantitative process mineralogy with bankable metallurgy to provide critical information for process flowsheet development and optimisation.

Working together, our team of highly experienced mineralogists, metallurgists and hydrometallurgists provide you with a complete understanding of how your ore will respond to extractive processes.

Our leading mineralogical team
Our highly experienced team of mineralogists and technicians work closely with our metallurgists and hydrometallurgists and pride themselves on providing the highest quality results and fast-turnaround times.

ALS Ammtec’s integrated mineralogical approach using QEMSCAN®, X-ray diffraction, HyLogger™ and optical microscopy provides clients with an accurate, quantitative understanding of the mineralogical variability within a deposit.

Automated mineralogical analysis using the QEMSCAN® provides accurate, fast, repeatable, quantitative mineralogical analysis of core samples, process feed and residue samples, and smelter products to maximise productivity and efficiency of base metal exploration, process design and optimisation, mining, production and rehabilitation processes.

... by providing you with the following information
• Prediction of leach parameters such as leach rates, acid consumption, acid generation & heat generation using quantitative mineralogical data.
• Identification & quantification of minerals including those that could potentially interfere with the extraction of the valuable elements.
• Elemental deportment of valuable, deleterious and penalty elements between minerals.
• Mineral liberation & locking analysis per size fraction with specific emphasis on surface exposure.
• Grain size and particle size data (down to less than 1µm).
• Mineral associations especially to characterise complex relationships between minerals that might influence leach behaviour.
• Textural information illustrating the complex relationships between the component minerals.
• When presented in tables & as digital particle maps, the data is a powerful communication tool during team discussions.
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