



## ALTA 2016 Hydromet Processing of Sulphides Forum Panel Discussion

May 2016

**Panel Chair:** Alan Taylor, ALTA Metallurgical Services (Australia)

**Panel Participants:** Ken Baxter, SNC Lavalin (Australia); Bryn Harris, NMR 360 (Canada); Dustin Pepper, Andritz (Australia); Grenvil Dunn, Orway Mineral Consultants (Australia); Peter Rohner, Core Group (Australia); Jason Fewings, Western Areas/BioHeap (Australia); John Neale, Mintek (South Africa); Arto Laukka, Mondo Minerals (Finland); Jacques Eksteen, Curtin University (Australia); David Dreisinger, INCoR Technologies, (Canada); Tannice McCoy, Teck Resources (Canada)

A wide ranging discussion was held involving contributions from the delegates as well as the panel members. The main focus was on whether we are any closer to hydromet overtaking smelting for sulphide concentrates. Some of key points emerging included:

- It was noted that pressure oxidation for sulphide concentrates is now commercially applied for copper, zinc, gold and nickel, and tank bio-oxidation has been recently commercialized for nickel sulphide concentrates.
- Also, hydromet processing of secondary copper ores is now well established (tank ferric leaching for high grade and heap bioleaching for low grade ores).
- However, the general consensus of the panel and delegates was that there is still insufficient commercial incentive to move away from smelting for primary copper concentrates with low impurities.
- There was also a consensus that while a significant move away from copper smelting is currently unlikely, there are some niche opportunities for copper hydromet processes including:
  - For concentrates with high impurity levels
  - To increase concentrate grade and overall copper recovery by processing cleaner
  - Tailings by hydromet to produce cathode
  - Where acid generated by a hydromet process can be utilized for leaching oxide ore
  - Where unused SX/EW facilities already exist

- Concentrates with high impurities, in particular arsenic, offer the greatest incentive for hydromet technology due to:
  - Rejection by smelters (although pretreatment by roasting is an option for smelters)
  - High penalty charges for smelting
  - Concentrate transport restrictions
- There are two basic strategies for applying hydromet to high impurity copper concentrates:
  - Selective removal of impurities from concentrates (e.g. Toowong and NONOX processes)
  - Complete hydromet treatment, which involves greater technical risk and high capex
- There is still an issue with precious metals recovery with some copper hydromet options whereas PM recovery by smelting/refining is well established and highly efficient.
- Smelting technology is not standing still and high efficiency acid plants have alleviated the off-gas environmental issue.

The topic for the ALTA 2017 Nickel-Cobalt-Copper Forum and Panel is Pressure Acid Leaching, which will be held 22-24 May in Perth, Australia.

**Alan Taylor**

Metallurgical Consultant/Managing Director  
ALTA Metallurgical Services  
[www.altamet.com.au/MetBytes](http://www.altamet.com.au/MetBytes)

For more information, see *ALTA 2017 Nickel-Cobalt-Copper Proceedings* and *ALTA Short Course A-Z of Copper Ore Leaching* available from [Publications](#)

*MetBytes are metallurgical commentary and insights written by Alan Taylor who has 40+ years' experience in the metallurgical, mineral and chemical processing industries.*

The [ALTA Free Library](#) includes proceedings from the ALTA 1995-2014 Nickel-Cobalt-Copper, Uranium-REE and Gold-PM conferences for free download (1150+ papers). The library will be expanded regularly, providing a valuable ongoing resource to the industry. A selection of papers from recent conferences are also available.