

Value-added materials from the hydrometallurgical processing of jarosite waste

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Abstract. Jarosite is a leach residue that can be produced by industrial bulk metal treatment processes and typically has the chemical formula $M_xFe_3(SO_4)_2(OH)_6$, where M normally represents a metal cation. The largest source of jarosite is electrolytic zinc processing [1], which worldwide has an annual production of 11-12 Mt and an associated jarosite waste of 5-6 Mt that can cause important challenges due to its classification as a problem waste. Moreover, as zinc ore typically contains many other commercial/critical metals, the content of valuable materials in this material is significant. An analysis of jarosite from Kokkola, Finland shows that it contained as much metal as many present day commercial ores: ~15% iron, 2% zinc, 3 % lead, 150 g/t silver, 0.5 g/t gold, 100 g/t indium and 40 g/t gallium. Until now, jarosite related research has concentrated on its use in landfill and construction purposes [2], though there is increasing interest in finding methods to efficiently reprocess/recycle jarosite into valuable products [3, 4]. The hydrometallurgical process currently under development by VTT and Aalto University exploits jarosite powdery nature to undertake wet chemical processing. This low cost and energy efficient operation is targeted at the recovery of concentrates which contain the major value-added metals.

References

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