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THE BEHAVIOUR OF STIBNITE DURING GOLD PROCESSING

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ABSTRACT

Antimony (Sb) is a toxic metalloid present at variable levels in refractory gold-bearing deposits and especially as the Sb mineral, stibnite. With Sb becoming soluble when exposed to the atmosphere, its mobilisation in mine waters poses an environmental risk around gold mines. More recently Sb has been growing in importance as a critical element in industrial and electronic applications which creates the opportunity for processing Au/Sb deposits with Sb as a potential by-product. In view of these factors, interest in the treatment of Au/Sb material continues to rise.

Unlike other toxic elements such as arsenic, a substantial research gap exists in knowledge and understanding the behaviour of Sb during gold processing and storage in tailings dams.

The current study focuses on the behaviour of stibnite during gold processing and more specifically the deportment of Sb into the different process streams. Solubilisation of Sb and the formation of new mineral phases were specifically studied.

Keywords: antimony, stibnite, solubility, gold processing, POX, cyanidation, tailings stability