

PROCESSING OF ENARGITE CONCENTRATES

BRANDON CHAMBERS

Enargite (Cu_3AsS_4) is an arsenic containing copper ore that is associated with high gold and silver contents, commonly found in the vicinity of various Chilean deposits. Arsenic poses a significant smelter penalty, various health & environment risks, and has a very limited market. Due to increasing demand for copper and gold and the decreasing attractiveness of available copper projects, industry pressure exists to extract value from enargite concentrates. A single stage sulphation roast, weak acid leach, and electrowinning process has been proposed; arsenic is fixed as a ferric arsenate and the leach residue will be amenable to cyanidation. Roasting's relative simplicity and efficiency, when combined with hydrometallurgical technologies, has the potential to be economically advantageous, easily scaled for on-site processing and positioned for future environmental, power & logistical variables.

In this research update, the results of an ongoing literature and thermodynamic review will be discussed. The results of thermalgravimetric (TG) differential thermal analysis (DTA) with evolved gas analysis (EGA), static bed roasting, and agitated leach tests will be reviewed. Analysis provided through inductive coupled plasma (ICP-AES), scanning electron microscope (SEM), and x-ray diffraction (XRD) will be utilized in the discussion.

Future experimental test work consisting of additional static bed roasting, agitated leach tests, electron microprobe and fluidized bed roasting will be outlined.

BIO

Brandon graduated in 2010 from Queen's University in the Robert M. Buchan Department of Mining. Brandon started his graduate studies in September 2010; John Peacey and Chris Pickles are his supervisors.