

Jordan University of Science and Technology

Ferric chloride leaching of chalcopyrite: Synergetic effect of CuCl_2

Authors: Mohammad Al-Harashseh, Sam Kingman, Adnan Al-Harashseh

Abstract: This work presents a study of the leaching of chalcopyrite in acidic ferric chloride. Two chalcopyrite samples (natural chalcopyrite crystal and chalcopyrite concentrate) were leached under different conditions. The effects of stirring speed and temperature were investigated. It was found that agitation had a negative effect on copper recovery from chalcopyrite during the leaching process. This is explained by the fact that cupric chloride complexes are formed during the leaching process where cupric ion is considered as a stronger oxidant than ferric ion. Agitation sweeps away the cupric chloride complexes formed, whereas, under stagnant conditions cupric chloride complexes accumulate at the reaction interface causing enhanced dissolution of copper. The overall leaching reaction was found to be sensitive to temperature. The shrinking core model was fitted to the data and it was found that the leaching process was controlled by chemical reaction with activation energy of 69 kJ/mole.