Geophysical Research Abstracts
Vol. 13, EGU2011-2816-2, 2011
EGU General Assembly 2011


# Characteristics of chalcopyrite bioleaching using indigenous acidophilicbacteria for recovering the valuable resources

Kanghee Cho (1), Bongju Kim (1), Daewoong Wi (1), Nagchoul Choi (2), Sungjae Lee (1), and Cheonyoung Park (1)

(1) Department of Energy and Resource Engineering, Chosun University, Republic of Korea, (2) Engineering Research Institute, Chonnam National University, Republic of Kore

Generally the bacterial leaching or bioleaching of base metal sulfides has been used for commercial objectives and offers more cost advantages than any other techniques such as pressure oxidation. Bioleaching also uses for catalyzing the dissolution of valuable metal species such as Zn, Cu, Ni or Co from sulfide ores or tailing by using of iron and sulfur oxidizing micro-organisms. This study investigated the efficiency of bioleaching and the surface alteration of chalcopyrite which taken from a abandoned mine under various batch experimental conditions using the indigenous acidophilic bacteria collected from acidic hot spring in Hatchnobaru, Japan. The results showed that as the bacteria grew in the growth-medium the pH of the growth-medium decreased and Eh increased. And the contents of Cu, Fe and Zn in the bacteria inoculating sample exhibited 2, 4 and 6 times more than in the absent bacteria sample, respectively. The results of XRD analysis of samples before and after bioleaching experiment revealed that the chalcopyrite d-value of peak heights of (220) crystal plane corresponding to 1.871 angstrom and (312) plane corresponding to 1.593 angstrom increased. In the SEM analysis, the rod-shaped bacteria with 1 micrometer in length were observed on the sphalerite surface and the filament morphology bacteria with ranging from 6 micrometer to 8.5 micrometer of length were attached singularly. This study informs basic knowledge when bacteria apply to eco-/economic resources utilization studies including the biomining and the recycling of mine waste system.