

Contribution to the chemistry of bacterial oxidizing on mineral sulphides

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Abstract Experiments of bacterial tank leaching on a pyrite concentrate made on mini-pilot and full pilot scale are presented. The concentrate also contains arsenopyrite, galena, and sphalerite and chalcopyrite as mineral sulphides. The results found that sphalerite and arsenopyrite have been oxidized at high rate while pyrite has been oxidized at the smaller rate. Such differences in oxidizing rate are due to the different values of the electrode potential of the mineral sulphides. The results of bacterial concentration and of bacterial oxygen uptake measurements allowed to make considerations about the mechanisms of bacterial oxidizing. During the first period of the leaching process the bacterial activity is mostly iron-oxidizing and the mineral sulphides are oxidized by an indirect mechanism. During the last period of the leaching bacterial activity is mostly sulphur-oxidizing one.

Keywords: bacterial oxidizing, mineral sulphide, mechanism, bacterial leaching.
