

ABSTRACT

The purpose of the present investigation is to determine the influence on the removal of manganese by addition of tailings in the treatment of acid water, one of the main effluents of the mining units. The research focuses on a particular case study; the acid effluent from the Carahuacra Mining Unit, which discharges into the Yauli River.

An experimental procedure was designed for the determination of the kinetics of the reaction, the operating pH; neutralization and oxidation treatment tests, and the determination of the neutralizing power of the tailings, additionally to evaluate the effect of modifying process parameters such as aeration times, sedimentation times, and treatment with and without sludge recirculation.

The neutralization tests carried out in the present investigation, with a sample of mine water having a pH from 6 to 7, showed that manganese can be removed by obtaining treated water with a concentration of <0.2 mg/L by the addition of lime slurry at a pH of 10.0, with stirring and aeration, and a settling time of up to 4 hours.

The results of the tests also show that the tailings of Carahuacra Mineral Unit have much lower neutralizing power than lime, the additions of tailings only allowed a minimum increase of the pH of the mine water, which is insufficient for the treatment, being concluded that the addition of tailings in the acid water treatment of the Carahuacra Mining Unit, does not favor the removal of manganese.

Finally, the removal of manganese from the acid mine water with addition of tailings, although important, the values obtained (less than 1 mg/L corresponding to a removal of the order of 99.0%) did not reach the ECA value of 0.2 mg/L, therefore its use does not influence mainly the removal of manganese.