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Development of experiments for recovery of copper from acid mine drainage through the process of membrane microfiltration based on a sulfidization reaction.

Acid mine drainage (AMD) is recognized as one of the more critical environmental problems in the mining industry, with the potential of severe contamination of surface, groundwater and soils. The most commonly technique to treat the AMD uses chemical neutralizers and a clarification stage for the elimination of suspended solids as sludge. This sludge has a non-economic value due to high concentrations of sulfates, metals and large effluent volume. Currently, membrane technology is an efficient alternative method used to treat AMD due to high capacity of salt and metal retention and reduction of effluent discharge. Since there are no studies focused on to assign economic value to the treatment of AMD through copper recovery, this thesis will address this approach. For this, the precipitation of copper is proposed through a sulfidization reaction following of microfiltration membranes separation. Therefore, experiments will be carried out in 2 L reactors for three different AMD concentrations and three NaHS dosifications. The most important results will be obtaining the highest recovery of copper, pressure and flux optimal and particle size.

Keywords

Acid mine drainage, sludge, clarification, sulfidization, microfiltration

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