

ABSTRACT

The discharges of industrial effluents to the municipal sewage of Lima are regulated by the Decreto Supremo N° 010-2019-VIVIENDA, rule that approved the «Regulation of Maximum Admissible Values (VMA), for the discharge of nondomestic wastewater in the municipal sewage system».

On the other hand, industrial companies that use urban drainage networks to drain industrial wastewater have a period of 5 years for the corresponding adaptation. In this context, the Industrial Heat Exchanger company, began its adaptation in 2013, carrying out a characterization of industrial wastewater, which reported, among other parameters, the presence of copper, lead, chrome and zinc metals; as well as acidity contents of the order of 5 pH units.

The separation of dissolved metals in solutions can be done through processes of neutralization and chemical precipitation of metals in the form of hydroxides, followed by solid-liquid separation operations. On the other hand, dissolved metals can also be removed, through processes of neutralization and chemical precipitation of metals by reducing them in the form of metal sulfides, a research process that is the subject of this thesis.

In the present study, the viability of the proposed process was evaluated through laboratory and industrial plant tests, determining the dose of reducing reagent (sodium sulfide), the pH of the process and the reaction time.

The tests were carried out at the laboratory level at the IMMA facilities of the UNI FIGMM and the tests at the plant level at the EIDIC facilities. For this purpose, certain infrastructure improvements were made to the existing wastewater treatment plant.

Experimental laboratory tests indicate that the conditions for optimal removal of dissolved metals from wastewater in the form of sulfides are a pH between 9 to 9,5, a reaction time of 45 to 60 minutes, and the dose of reducing reagent. (Na₂S) depends on the initial pH. NaOH reagent should be used as a neutralizing agent for pH less than 5 due to its higher reactivity and corresponding cost.

Keywords: removal, contaminants, lead, copper