

**İTÜ**



## ***SELECTIVE SULPHUR FLOTATION***

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## 1. GENERAL INFORMATION

The flotation method was first applied to sulphides, and then it was started to be applied oxide minerals. Different type of chemicals is used for the beneficiation of sulphide minerals. One of the most important thing in flotation is to decide the proper reagent type. Because of the similarity of surface property of sulphide minerals activator and the depressant have a crucial role. On the other hand, regulation of pH is another parameter that affects the success of selective sulphide flotation. Sulfide ore flotation can be divided into the following four metal-value-based groups based on certain common features of ores and mineralogy in each group, flow sheets, and metallurgical objectives.

- 1) Cu, Cu-Mo and Cu-Au ores
- 2) Complex, polymetallic ores such as Pb-Cu-Zn-Ag
- 3) Primary Au and Platinum Group Metals (PGM) ores
- 4) Ni ores

### 1.1. Purpose of The Experiment

In this experiment, the sample supplied from Esan, Balya Lead – Zinc plant used for flotation. The main goal of this experiment gain lead and zinc concentrate separately with selective flotation and also remove gang minerals such as pyrite and quartz. During the test, reagent types that are used for sulphide flotation will examine.

### 1.2. Material and Method

Flotation tests were carried out in a Denver laboratory flotation machine with a 1200 rpm of rotation speed. In experiment, 500 g sample which is sized-212  $\mu\text{m}$  was used. Reagent types and experiment parameters are given below, respectively.

#### REAGENTS

- Collectors: KEX (%1), KAX (%1),
- Activator and depressants:  $\text{ZnSO}_4$  (%10),  $\text{CuSO}_4$  (%10),  $\text{Na}_2\text{SiO}_3$  (%10)
- pH regulators: Lime,  $\text{H}_2\text{SO}_4$
- Frothers: MIBC (%1)

## **PARAMETERS**

### **Pb Flotation:**

pH: 9,5

Na<sub>2</sub>SiO<sub>3</sub>: 500g/t

ZnSO<sub>4</sub>: 500g/t

KAX: 25 g/t

MIBC: 20 g/t

Condition Time: 10 dk

Flotation Time: 1 dk

### **Scavenger:**

pH:9,5

KAX: 10 g/t

Condition Time: 3dk

Flotation Time: 1dk

### **Zn Flotation:**

pH:11-11,5

CuSO<sub>4</sub>: 500 g/t

KEX: 50 g/t

MIBC: 20g/t

Condition Time: 5 dk

Flotation Time: 1 dk

### **Scavenger:**

CuSO<sub>4</sub>: 300 g/t

KEX: 20 g/t

Condition Time: 3 dk

FlotationTime: 1 dk

## 2. POST LAB QUESTIONS

- Give detailed information about Sulphur flotation.
- Explain the properties of reagent and their mechanism which are used in flotation.
- Explain the experimental procedure.
- Calculate the each reagent dosage.