



## ABSTRACT

This study deals with investigation of concentration of Zn and Pb metals in the sulphide ore deposit located in Livan area north Zazho province in Kurdistan territory/ Iraq.

The flotation technique which is mall known for concentration of such type of ore is used in this study.

Lead and Zinc metals are important from industrial point of view for their wide application in different industries.

Ore samples weighted (25) kg are collected from the deposited cropped out in Livan area. Chemical analysis show that the sample contained (17.77) % Zn and (7.67) % Pb which are interesting grades for exploitation to develop the national industry. A part of that, chemical analysis shows certain concentration of K, Na, Fe and Mg.

Mineralogical analysis results using XRD technique are in correspondence with the chemical analysis where sphalerite ( $ZnO$ ), Galena ( $PbO$ ), pyrite ( $FeS$ ), Smithsonite ( $ZnCO_3$ ) and other minerals are identified.

The applied flotation technique is designed to envisage envisaged several parameters such as: pH of the media within (5.5 to 9.5) range, particle sizes of the ore (+150-300,+106-150,+75-106,+53-75,-53) micron, effect of the collector quantity (Sodium ethyl xanthate ) within (0.5-0.007) gm/300gm range, effect of the activator agent ( $CuSO_4$ ) quantity (0.41-0.07)gm/300gm and finally conditioning time (25,20,15,10,5) minutes.

The obtained results (both Zn&Pb flotation together) revealed that Zn is concentrated to a level of the (25.29) % with recovery of (52.52) % within the following parameters and conditions:

- (9.5) pH by the addition of (1.36) gm/300gm of CaO.
- (+75-150) micron particle size.
- (0.34) gm/300gm of (Sodium ethyl xanthate) collector.
- (0.27) gm/300gm of ( $\text{CuSO}_4$ ) activator.
- (0.03) gm/300gm of foaming agent (detergent).
- (5) Minutes conditioning time.

For lead the obtained results indicated that it is concentrated to a level of (35.38) % with recovery of (61.73) % within the fallowing conditions and parameters:

- Similar condition for Zinc regarding pH value (9.5).
- Similar condition for Zinc regarding collector agent.
- (10) Minutes conditioning time.
- The addition of activator ( $\text{CuSO}_4$ ), had a negative effect on floating the lead, so the best result recorded for concentrating and recovering the lead was at the lower limit of ( $\text{CuSO}_4$ ) addition i.e. (0.07) gm/300gm.