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Removal of arsenic in flotation of galena and sphalerite

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In Korea, Janggun mine that produces the concentrate of galena (PbS) /sphalerite (ZnS) containing arsenic of 1.3% charges a penalty of US$ 3/ton to LS-Nikko smelter. Hence in this work, flotation tests for removal of arsenopyrite (FeAsS) from sulfide minerals were carried out using lab scale flotation cell, which maintain grade and recovery of PbS and ZnS in comparison to flotation plant. Particularly, this study was focused on investigating the combination of several chemical reagents such as depressant, collector, activator and etc. that affect flotation performance. In the straight differential flotation for PbS, a PbS grade of 67.80% and a recovery of 80.2% could be obtained with FeAsS removal of 84.1% (0.2% As) under the conditions of 20% feed solids concentration, pH 8.5, 50g/t frother (AF65), 50g/t collector (AP242) and 600g/t As depressant ($NaHSO_3$) and 600g/t Zn depressant (ZnSO4). In the ZnS flotation, the maximum separation achievable for ZnS has been shown to be a grade of 50.27% and a recovery of 88.7%. At this time, FeAsS removal of 87.8% (0.16% As) could be successfully accomplished under pH 11, and 1.2kg/t Zn activator (CuSO4), 100g/t frother (AF65), 100g/t collector (AP211) and 400g/t As depressant ($NaHSO_3$).

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