Original
Received January 30, 2014
Accepted for Publication March 13, 2014

Floatability and Bubble Behavior in Seawater Flotation for the Recovering Copper Mineral

Kazutoshi HAGA※, Kosuke NISHIOKA※, Batnasan ALTANSUKH and Atsushi SHIBAYAMA※

※Graduate School of Engineering and Resource Science, Akita University,
1-1 Tegata gakuen-cho Akita 010-8502, Japan
E-mail : khaga@gipc.akita-u.ac.jp

Currently, feasibility studies of seawater flotation for copper recovery from ores have been carried out in the mineral processing field. In this study, we investigated the influence of seawater on behavior of particle and bubbles of the copper flotation. Samples of crude copper sulfide ore mainly containing chalcopyrite ($CuFeS_2$), magnetite (Fe_3O_4) and quartz (SiO_2) were used in this study. The results showed that copper recovery by flotation with methyl iso butyl carbinol (MIBC) in distilled water and seawater reached 97% and 86%, respectively. It was observed that when DOW froth 250 was used as a frother in flotation in distilled water, copper (Cu) recovery didn' t change obviously, whereas the copper recovery increased up to 97% in flotation in seawater. It can be seen that diameter of bubbles in the seawater was increased when use the frother (DOW froth 250) in the flotation. The froth layer generated from the flotation in seawater is thicker than that flotation in distilled water. The thickness of froth layer which may be the reason why the copper recovery was higher in seawater flotation.

Key Words : Seawater, Flotation, Copper mineral