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The Role of Locust Bean Gum in The Flotation Separation of Chalcopyrite and Talc

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The separation of chalcopyrite and talc by froth flotation is a challenge to the whole mineral processing industry as talc is naturally hydrophobic and easily reports to flotation concentrates. To solve this problem, the role of locust bean gum in the flotation separation of chalcopyrite and talc has been studied and its depression mechanism to talc has been discussed. The single mineral flotation results show that both chalcopyrite and talc are floatable in the tested pH range from 3 to 11 and locust bean gum can depress the flotation of both chalcopyrite and talc. However, locust bean gum has stronger depression effect on talc at the pH range of 5-9 with a dosage of 100mg/L. The flotation test on mixed minerals indicates that the use of locust bean gum as depressant can achieve the flotation separation of chalcopyrite from talc and a concentrate with Cu grade of 30.10%, and Cu recovery of 88.06% was achieved when the Cu grade of feed is 15.15%. The reason is that the adsorption amount of locust bean gum on talc surface is larger than that on chalcopyrite surface. Zeta potential and XPS measurements showed that the locust bean gum adsorbed on talc surface mainly through hydrophobic interaction.