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The Flotation Device Designed to Treat Phosphate Rock

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Abstract : To overcome the some shortcomings associated with traditional flotation machines and columns in collophanite flotation, a flotation device was designed and fabricated in the laboratory. A multi-impeller pump with same function as a mechanical cell was used instead of the injection sparger and circulation pump in column flotation unit. The influence of main operational parameters of the device like feed flow rate, air flow rate and impellers’ speed on collophanite flotation was analyzed. Experiment results indicate that the influence of the operational parameters were significant on flotation recovery and grade of phosphate concentrate. The best operating conditions of the device were: feed flow rate 0.62 L/min, air flow rate 6.67 L/min and impellers speed 900 rpm. At these conditions, a phosphate concentrate assaying about 30.5% P₂O₅ and 1% MgO with a P₂O₅ recovery of about 81% was obtained from a Yuan'an phosphate ore sample containing about 22.30% P₂O₅ and 3.2% MgO.

Keywords : collophanite flotation, flotation columns, flotation machines, multi-impeller pump
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