

Pressurized Flotation Systems for Froth-free Concentrators

Gerard Rowe, Andrew Luke, Chester de Leon and Glenn Dobby

Woodgrove Technologies Inc., Toronto, Canada

The key component in flotation systems is the selective particle attachment to gas bubbles. This provides the important step in separation of mineral species. The subsequent requirement for bubble-particle transport to an external collection launder via a froth phase complicates the overall process, and is often a limiting step. In other words, a significant challenge in froth flotation is the froth itself. This paper will describe a flotation separation process that transports bubble-particle aggregates to a collection pipe via bubbly flow. A conventional froth is not created. The separation system is pressurized, and product recovery is controlled through a control valve. Pressurization is attained through a pump or a head tank, and allows for multiple separation stages in series that are constructed on a single elevation, with product pipes flowing into a common collection box. This results in space savings and power savings over conventional mechanical cell froth flotation equipment. Low air rates and multiple stages provides significant selectivity enhancement over flotation columns. Woodgrove's pilot testing of the equipment is described, and examples are provided for copper sulfide, nickel (pentlandite) and gold recovery.