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SX CIRCUIT, CRUD TREATMENT, CONCENTRATION-DEPENDENT POND DEPTH ADJUSTMENT FOR DECANTER CENTRIFUGES, DCONTROL®

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ABSTRACT

For the economic extraction of important precious metals - nickel, zinc, platinum, gold, cobalt, uranium and rare earths, there are various process engineering routes to extract these important metals from the ore. One established and economical process is the hydrometallic process route with integrated solvent extraction (SX), which separates these metals after leaching in a solution.

All pilot and commercial SX systems experience the formation of crud - a solid-stabilized emulsion that accumulates at the aqueous/organic interface in the settlers of the solvent extraction stages. It is caused by a variety of substances entering the SX circuit, such as windblown dust, entrained solids from leaching, impurities in the plant solutions. While a thin layer of at the aqueous/organic interface can promote coalescence of fine droplets, excess crud interferes with phase separation resulting in greatly reduced extraction efficiency of the settling tanks. Crud prevents mass transfer from proceeding efficiently at the phase interface. This crud can be solved by our technology of 3 phase decanter centrifuges. By centrifugal force we are able to separate this crud layer continuously into its individual components.

How the 3 phase decanter centrifuge technology works

The design and operation of the three-phase centrifuge is similar to that of a decanter (two-phase separation). The solids settle on the inner wall of the bowl under the action of centrifugal force. The screw takes care of the solids transport for centrifuged solids with a differential speed to the decanter bowl. The decisive difference to the decanter lies in the separate expulsion of the two liquid phases. In the 3-phase decanter centrifuge, the light liquid is discharged under pressure with subsequent DControl monitoring. The heavy liquid flows out without pressure. The DControl allows stepless adjustment of the pond depth during operation and leads to fast and precise adaptation to changing feed conditions without interrupting operation. This DControl system is presented in detail in this paper and presentation.

Keywords: SX circuits, crud treatment, decanter centrifuge, Dcontrol