CHARACTERIZING FLOTATION RESPONSE: A THEORETICAL AND EXPERIMENTAL COMPARISON OF TECHNIQUES

by

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(ABSTRACT)

Over the past 40 years, several procedures have been proposed for characterizing ideal flotation behavior. These procedures, known as release or tree analysis, generally involve multi-stage flotation in batch, laboratory flotation cells using various combinations of rougher, cleaner, and scavenger configurations. Although some of these procedures have been experimentally compared, there remains considerable controversy as to which approach best approximates the ideal flotation response. In this investigation, modeling and simulation techniques are used in conjunction with experimental studies to compare three procedures commonly used for characterizing flotation behavior. These procedures include timed release analysis, simplified release analysis, and tree analysis. Timed release analysis is shown to produce superior results to simplified release analysis and tree analysis; although simplified release analysis appears to be best suited for locating the “elbow” of the grade-recovery curve. In no case, do any of these techniques approximate a perfect separation. A novel technique, known as reverse release analysis, is described and demonstrated to be superior to the other three procedures. Finally, a theoretical methodology for obtaining the true ideal separation curve is presented.

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