

Deconstructing the Leaching Ratio

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Abstract

The heap leaching process has been widely used for recovering different metals since its first application at the end of the 1960s. In Chile, copper production via heap leaching has accounted for between 30 and 40% of annual copper production over the past 10 years. This level of production has been achieved through and supported by the use of a mathematical relation, known as the leaching ratio (LR) or irrigation ratio (IR), which relates operational parameters with metal extraction in a heap leaching operation. This ratio has been used to develop leaching column tests, to scale up results from the laboratory to industrial operations, to design new heap leaching plants, and in metallurgical control and production estimation. In spite of the widespread industrial use of this relation, few scientific studies mention it. This is due to its simplicity and basic theoretical foundations. This disparity between industrial practice and scientific research could lead to operational decisions which lack substantial theoretical support, and to scientific studies which have limited industrial impact. Against this background, several questions arise about the use of the LR: What are the constraints on the use of the LR? Are there practical advantages with respect to reported kinetic models? What is the main reason that industry prefers the use of the LR over kinetic models, which enjoy greater theoretical support? In order to guide its future use, this paper describes the leaching ratio and its current uses and limitations, through a literature review and case studies.

Palabras clave

Palabras clave de autor: [Leaching ratio](#); [Irrigation ratio](#); [Heap leaching](#); [Scale-up and design](#)

KeyWords Plus: [HEAP](#); [KINETICS](#); [MODEL](#)

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