

USING CFD IN THE DESIGN AND SCALE-UP OF HYDROMETALLURGICAL PROCESSES

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ABSTRACT

Process intensity, maximised availability, operational simplicity, and equipment robustness are key parameters required of hydrometallurgical processes in order to protect market share and ensure an acceptable return on capital investment. Achieving the targets set for these parameters requires that the job gets done right the first time. To accomplish this, there is a need to apply analysis and design tools that allows for process evaluation through virtual prototyping so that risks and uncertainties are minimised. One of the most powerful tools that have recently come to the forefront for use in hydrometallurgical process development and design is computational fluid dynamics

(CFD). CFD provides the designer with the ability to model the complex multi-phase, multi-species flows found in hydrometallurgical processes and evaluate the effect of different process variables and length scales, thereby achieving a superior level of confidence in the design. This paper will discuss the application of CFD in the design and scale-up of hydrometallurgical processes, with specific emphasis on the effect of slurry rheology in heat transfer and mixing applications. Examples taken from actual design assignments are used for illustration.

