

# DESIGN OF CRYSTALLISATION PLANTS FOR THE PRODUCTION OF BATTERY GRADE LITHIUM HYDROXIDE

By

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## ABSTRACT

The rapid rise in demand for long-range, fast charging batteries for the electric vehicle market has resulted in simultaneous rapid growth in the supply chain for battery feed materials. As the energy density of the resulting batteries increases, so too does the requirement for ultra-high purity battery feedstocks.

Differing geologies and upstream chemistries result in a broad range of impurities in the feed solutions to lithium hydroxide monohydrate (LHM) crystallisation plants. These challenging and various feeds require careful assessment to develop flowsheets optimised for each application. The primary focus is on achieving stringent and ever-increasing product purity requirements, whilst concurrently minimising capital and operating costs, and lithium losses to the extent practical. Sophisticated simulation software and extensive test work are employed to develop robust flowsheets to process these differing feed chemistries and achieve the plant objectives outlined before.

This paper briefly outlines the LHM market outlook, typical feed chemistries from varying sources and the fundamental balance between purity versus capex and opex during flowsheet development. This process has been demonstrated with a case study.

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