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THE DEVELOPMENT OF THE BATTERY GRADE LITHIUM HYDROXIDE MONOHYDRATE FLOWSHEET TO MEET THE DEMANDS OF WIDELY VARYING FEED CHEMISTRY

By

Angelo Rideout[1], Dave Rogans[1] and Nipen M. Shah[2]

[1]JordProxa, South Africa
[2]JordProxa, Australia

Presenter and Corresponding Author

Nipen M. Shah

ABSTRACT

The rise in demand for low-cost, high-energy density, fast charging, safe and reliable batteries for the electric vehicle market is driving process and flowsheet development to produce high-quality low-cost precursor materials.

Differing geologies and upstream chemistry in particular present a broad range of “impurity fingerprints” in the feed solutions to the lithium hydroxide monohydrate (LHM) crystalliser designers. These challenging feeds require careful examination and testing to prepare optimal flowsheets for each application with primary focus on meeting the stringent purity requirements, whilst seeking a balance between capital and operating costs.

With the use of sophisticated simulation software and extensive technical know-how, robust flowsheets have been developed to handle these differing feed chemistries. Moreover, extensive testwork has been performed utilizing a team of chemical engineers to interrogate each application and validate the developed flowsheet.

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. Various examples of these aspects are presented.

Keywords: Lithium hydroxide, crystallisation, product purity, battery

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