Desalination and Water Treatment
www.deswater.com

doi: 10.5004/dwt.2022.28121

250 (2022) 148–158
February

Magnesium ion effect in the process of lithium migration in salt lake

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Received 10 September 2021; Accepted 30 December 2021

ABSTRACT

The Mg/Li ratio is an important factor in the extraction of Li^+ from salt lake brine. Since Mg^{2+} can exist by competing with Li^+ in the carbonate phase, the cost and energy consumption of Li extraction from salt lakes, is directly affected by the ratio. This article considers the influence of different content of Mg^{2+} on Li_2CO_3 crystal in Na^+, Li^+, $CO_3^{2-}//H_2O$ crystallisation system. In the experiment and calculation simulations, the morphology, particle size and purity of Li_2CO_3 crystals under various Mg/Li ratios were studied. We analysed the mechanism of Mg^{2+} in the Li_2CO_3 crystallisation system, and established the governing equation in relation to the Mg^{2+} content and specific surface area. This research provides theoretical guidance for improving the utilisation rate of Li resources and strengthening the Li_2CO_3 crystallisation process in salt lakes.

Keywords: Salt lake; Li_2CO_3; Mg^{2+}; Specific surface area; Adsorption and doping; Density functional theory

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