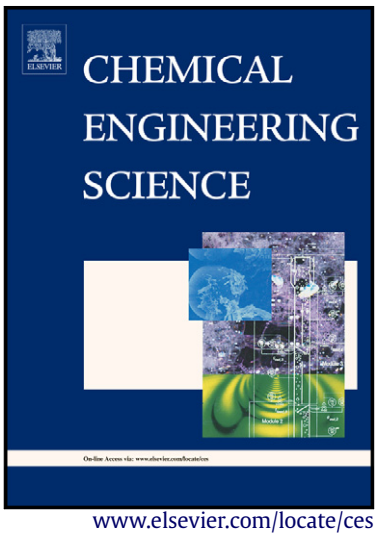


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# LITHIUM BROMIDE CRYSTALLIZATION IN WATER APPLIED TO AN INTER-SEASONAL HEAT STORAGE PROCESS

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## Abstract

This work is part of a larger study dedicated to an inter-seasonal heat storage process based on novel absorption pump operated in two half-cycles that uses LiBr/$H_2O$ as the absorbent/absorbate couple. The solar energy is stored during summer through desorption, and the heat is released during winter through absorption. A characteristic of the device is that crystallization occurs in the storage tank as its temperature falls under 10°C at the end of summer or in winter. Thus, information on the degree of hydration of the crystals at low temperature is required to optimize the storage density. This paper aims to precisely determine the behavior of LiBr in terms of crystallization. In this study, solubility and metastable zone limit curves were assessed using an agitated and thermostated batch crystallizer. A video sensor was employed for assessment of the crystals morphology and thus, the hydrated crystalline forms present inside. The transition temperature between lithium bromide dihydrate and trihydrate was found to be equal to 3.0°C. The dissolution and crystallization enthalpies were also calculated using the Van't Hoff plot, and results were found to be in good agreement with the literature data.