

CAO Lina, LIU Mingming, GAO Daolin, GUO Yafei and DENG Tianlong . 2014. Transformation Process and Mechanism of Lithium Borates. *Acta Geologica Sinica* (English Edition), 88(supp. 1): 127.

Transformation Process and Mechanism of Lithium Borates

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Amounts of lithium-containing salt lake brine resources are widely distributed in the four provinces named Qinghai, Tibet, Inner Mongolia and Xinjiang province, especially the salt lakes in Qinghai-Tibet Plateau are abundant of lithium and boron resources. Borates not only occupy an important position in the modern inorganic salt industry, but also have been widely used in many departments of national economy, national defense industry, high and new technology industry. There are lots of behaviors of borate crystals in the world, and also exist reciprocal transformation in the aqueous solution. Therefore, study on lithium borates transformation is of great significant to

optimize for separating lithium and boron from salt lake brine.

In this paper, the influences of translative temperature, pH, reaction time, the content of Li_2SO_4 and LiCl on the transformation behaviors of LiBO_2 and Li_2BO_7 under the condition of steady state with the single factor variable method were investigated. Similar to the stable state, the effects of stirring speed, pH, translative temperature, the co-exsited of Li_2SO_4 and LiCl under the conditions of metastable state were also conducted. The influence of reactive time on the transformation of LiBO_2 and Li_2BO_7 at $T = 298.15 \text{ K}$ was shown in Figure 1. From Figure 1, it can be seen clearly that the lithium boron mole ratios of LiBO_2 and Li_2BO_7 are 1:1 and 1:2, respectively.

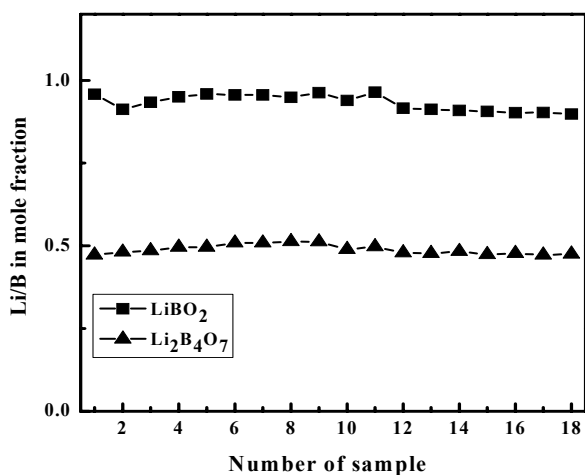


Fig. 1 Effect of reactive time on the transformation of LiBO_2 and Li_2BO_7 at 298.15 K

Acknowledgements

Financial support from the State Surface Project of National Natural Science of China (21276194), the Specialized Research Fund for the Doctoral Program of Chinese Higher Education (20101208110003) and the Key Pillar Program of Tianjin Municipal Science and Technology (11ZCKGX02800) is acknowledged

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