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Introduction

Borates have been used generally in numerous fields and are regarded as crucial materials, which have great applications in lithium battery electrolyte solutions, whisker materials, laser materials and other high technology domains [1, 2].



Fig. 1 Application of lithium borate

Experimental Apparatus



Fig. 2 TAM IV microcalorimeter

Characters:

- 297.15 ~ 423.15 K;
- ± 100 nW, 200 nW/24h;
- $T \pm 10^{-6}$ K;

Precision syringe weigh the certain mass solutions of and the deionized water into the reaction cell and reference pool with a precision syringe and then embedded into the calorimeter rod. After assembly, the whole calorimeter rod is placed in the thermostat.

Results and Discussion

- The heats dilution in the binary systems of the ($\text{LiBO}_2 + \text{H}_2\text{O}$) and ($\text{LiB}_5\text{O}_8 + \text{H}_2\text{O}$) have been measured at 308.15 K and 101.325 kPa. As to the former system the apparent molar enthalpy increases slowly and then increased sharply but the later system the apparent molar enthalpy increases slowly as the increasing of molar
- On the basis of series of the enthalpies of dilution of LiBO_2 (aq) and LiB_5O_8 (aq), the reliable single – salt - parameters $\beta^{(0)L}_{\text{MX}}$, $\beta^{(1)L}_{\text{MX}}$, $\beta^{(2)L}_{\text{MX}}$ and C^L_{MX} of $\text{LiB}(\text{OH})_4$ and $\text{LiB}_5\text{O}_6(\text{OH})_4$ were obtained based on the modified Pitzer ioninteraction theory.

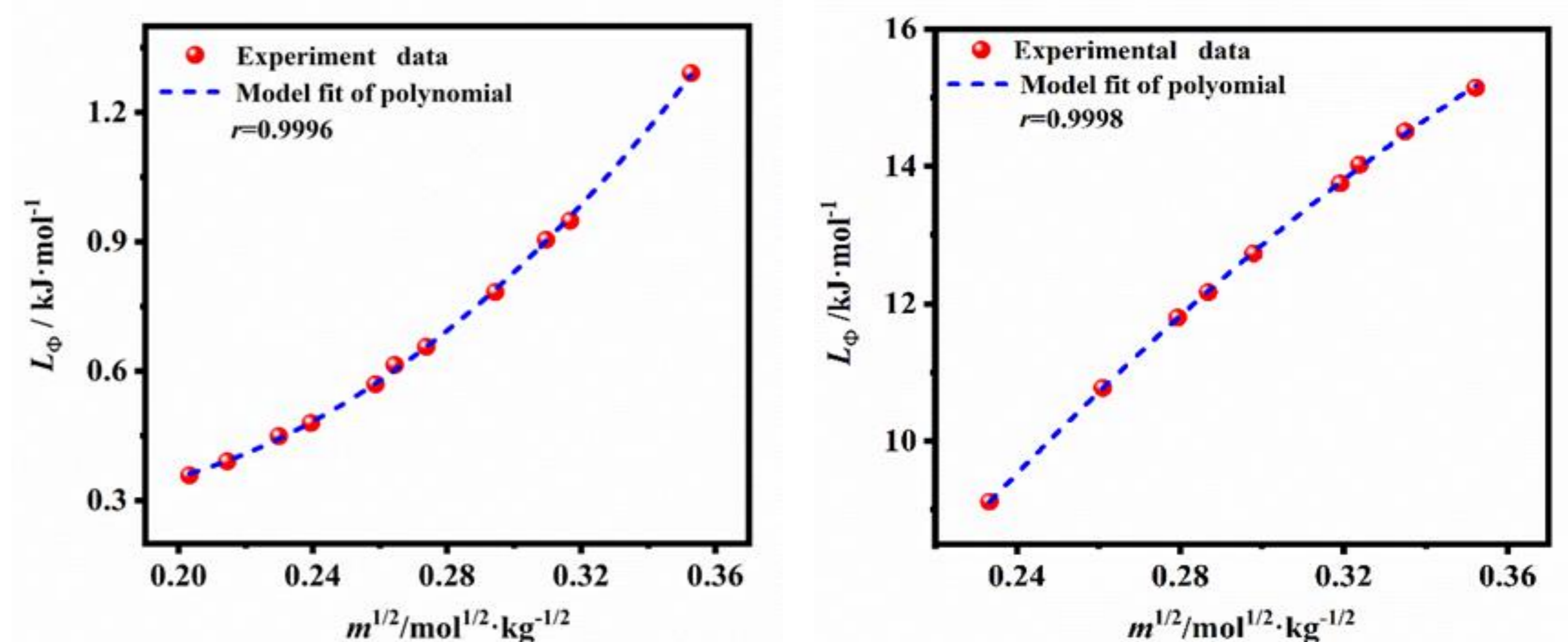


Fig.3 The apparent molar enthalpies of LiBO_2 and LiB_5O_8 solutions against their molality plotted versus $m^{1/2}$ at 308.15 K.

References

- [1] W. Qiu, K. Yan, F. Lian, Y. Qiao, Application of Boron-Based Lithium Salt for Li-Ion Battery. Progress in Chemistry 23 (2011) 357-365.
- [2] R. Chen, Z. He, F. Wu, Lithium Organic Borate Salt and Sulfite Functional Electrolytes. Progress in Chemistry 23 (2011) 382-389.

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