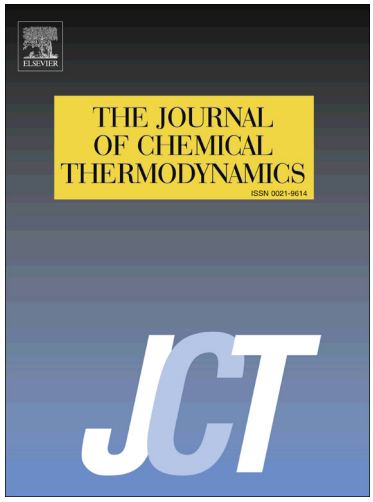


# Comment on "Volumetric properties of aqueous solution of lithium tetraborate from 283.15 to 363.15 K at 101.325 kPa" [J. Chem. Thermodyn. 120 (2018) 151–156] and its Corrigendum [J. Chem. Thermodyn. 123 (2018) 195–197]

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## ABSTRACT

Inconsistencies in the apparent molar volume values for aqueous lithium tetraborate solutions reported by Guo and co-workers are exacerbated in the Corrigendum by Cao and co-workers. At 363 K the discrepancies relative to the corrected values in this work exceed 20 $cm^3$ $mol^{-1}$ and 100 $cm^3$ $mol^{-1}$ near 0.01 mol $kg^{-1}$ for Guo et al. and Cao et al., respectively.

## TEXT

The purpose of this short communication is to alert readers to an ongoing problem with the published volumetric data for aqueous lithium tetraborate. Recently, Guo et al. [1] reported density values for such solutions in the temperature range from (283.15 to 363.15) K and molality from (0.01 to 0.12) mol $kg^{-1}$. Apparent molar volumes, $V_\phi$, for $Li_2B_4O_7$(aq) were calculated according to Eq. (1)

$$V_\phi = \frac{1000(\rho_w - \rho_s)}{m\rho_w\rho_s} + \frac{M}{\rho_s} \quad (1)$$

where $\rho_w$ is the density of pure water at the same pressure and temperature as the measurement, $\rho_s$ is the density of the lithium tetraborate solution, $m$ is the molality of the solution (moles of $Li_2B_4O_7$ per kg of water) and $M$ (= 169.12 g $mol^{-1}$) is the molecular mass of $Li_2B_4O_7$.

While entering these data into our JESS database, we found that the densities and apparent molar volumes reported by Guo et al. [1] were not in accord with Eq. (1). Cao et al. [2] also recognised this issue and published a Corrigendum to Guo et al.'s [1] apparent molar volumes. However, in attempting to address the issue Cao et al. [2] have used $\rho_w$ values differing from those recommended by IAPWS (International Association for the Properties of Water and Steam) [3] (Fig. 1). This leads to significant discrepancies. Values of $V_\phi$ consistent with the