Optimising a commercial drop calorimeter for high temperature Lead borate drop solution calorimetry

Christoph B. M. Groß[1], Christoph Berndhäuser[2], Axel Engel[1], Ulrich Fotheringham[2]
[1]*Physical Analytics, SCHOTT AG, Mainz, Germany*
[2]*Research and Development, SCHOTT AG, Mainz, Germany*

High temperature Lead borate drop solution calorimetry is a versatile tool for the determination of thermochemical data of a wide range of chemical compounds.[1] The method is especially useful for the determination of the enthalpy of vitrification of compounds that can be obtained both as vitreous and crystalline phase.[2]

At SCHOTT a Setaram MHTC drop calorimeter was optimised for this technique by small but significant changes in the calorimeter hardware, and by the development of bespoke experimental protocols.

Experimental data of α-Quartz (SiO_2), α-Alumina (Al_2O_3), and Lisitsynite ($KBSi_2O_6$) are presented. Potentials and limits of the experimental set-up are discussed.

[1]: A. Navrotsky, *J. Am. Ceram. Soc.*, **2014**, *97*, 3349.
[2]: L. Wu, A. Koryttseva, C. B. M. Groß, A. Navrotsky, *J. Am. Ceram. Soc.*, early view, https://doi.org/10.1111/jace.16323