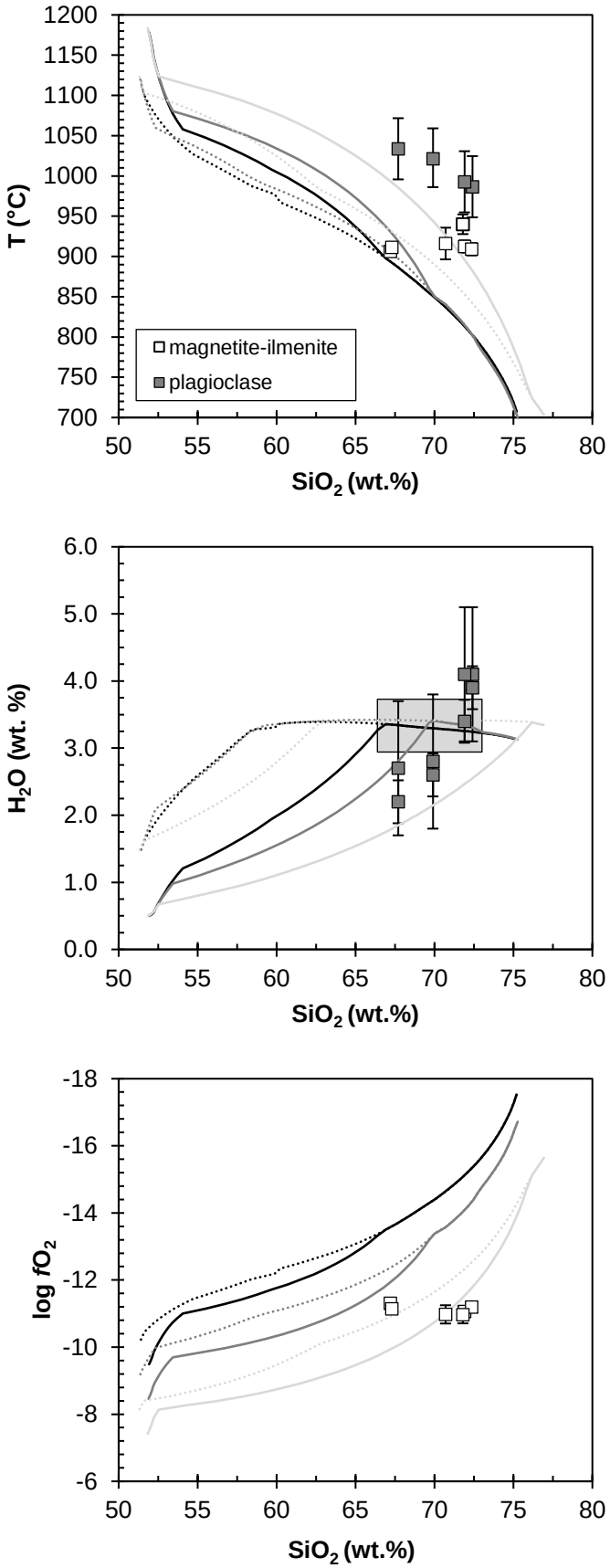

Fig. A1. Comparison of the MELTS simulations and the thermodynamic calculations. The different lines represent the isobaric (~0.71 kbar) MELTS simulations based on different starting parameters: solid (H_2O = 0.5 wt. %), dashed (H_2O = 1.5 wt. %), black (FMQ -1), dark grey (FMQ), light grey (FMQ +1). The grey field represents the estimated water saturation level of the Brothers melts at isobaric conditions (~0.71 kbar), temperatures of 850 °C to 1050°C and with respect to the melt composition indicating that water saturation has been reached during magmatic differentiation. The overlap in the results between these two independent methods confirm that they are in a reliable range. Details to the different methods as described in the text (section 5.2).