



Supplemental Figure S1: Residuals are shown for both the (A) Classic-OSaS oxybarometer and (B) the MELTS-OSaS oxybarometer for model applications to samples with >10.5 wt% MgO from the studies of Matzen et al. (2011) and from Zhang et al. (2023). Both models systematically over-predicted values of fO_2 , leading to systematic, negative residuals that approach and exceed model error estimates. Because both models have this pattern, we attribute the offset to MELTs predictions of the activity of silica in the melt and not some other model parameter (e.g., the correction to the chemical potentials of magnetite implemented in the MELTS-OSaS model).