

Further work on experimental plagioclase equilibria and the Skaergaard liquidus temperature

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ABSTRACT

Equilibria between plagioclase and ferrobasaltic melt in low-pressure, dry melting experiments can be demonstrated near the liquidus. Further analyses of melting experiments using optimized beam conditions reveals that previous data for understanding the Skaergaard intrusion potentially suffered from the analytical inclusion of non-equilibrated components in the average plagioclase compositions. New reversal experiments demonstrate convergence between plagioclase rim compositions in melting and crystallization products for a ferrobasaltic melt and thus support equilibrium relations. The new data set provides tighter bounds on experimental plagioclase composition and documents composition-dependent partitioning of Na and Ca between plagioclase and melt. Application of the results to modeling the Skaergaard requires only minor adjustments to the previously proposed liquidus temperatures and liquid line of descent.

Keywords: Plagioclase, melting experiments, equilibrium, Skaergaard intrusion, liquidus temperature