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# Partial melting of granitoids under eclogite-facies conditions: nanogranites from felsic granulites from Orlica–Śnieżnik Dome (Bohemian Massif)

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Melt inclusions (MI) study in migmatites is a powerful tool to retrieve the original composition of the anatectic melt, both as major elements (Ferrero et al., 2012) and fluid contents (Bartoli et al., 2013). Crystallized MI, or "nanogranites" (Cesare et al., 2009), were identified within HP felsic granulites from Orlica–Śnieżnik Dome, NE Bohemian Massif (Walczak, 2011). The investigated samples are Grt+Ky leucogranulites originated from a granitic protolith, with assemblage Qtz+Pl+Kfs+Grt+Ky+Ttn+Rt+Ilm. Nanogranites occur in garnet as primary inclusions, and consist of Qtz+Ab+Bt+Kfs±Ep±Ap. Such assemblage results from the crystallization of a melt generated during a partial melting reaction; the same reaction is also responsible for the production of the host garnet, interpreted therefore as a peritectic phase. Besides nanogranites, former presence of melt is supported by the occurrence of tiny pseudomorphs of melt-filled pores (Holness & Sawyer, 2008) and euhedral faces in garnet. Garnet composition, with Grs =0.28–0.31, phase assemblage (kyanite, ternary feldspar) and classic thermobarometry suggest that partial melting took place at T$\geq$875°C and P$\sim$2.2–2.6 GPa, under eclogite-facies conditions. Although other authors reported palisade quartz after coesite in this area (see e.g. Bakun-Czubarow, 1992), no clear evidence of UHP conditions have been identified during this study. Piston cylinder re-homogenization experiments were performed on MI-bearing garnet chips to obtain the composition of the pristine anatectic melt. The first data from experiments in the range 850–950°C and 2–2.2 GPa show that nanogranites can be re-melted at T$\geq$875°. However, homogenization has not been reached yet since new Grt, with lower CaO and higher MgO, crystallizes on the walls of the inclusion. As P increases, the modal amount of new phase decreases, while its composition evolves closer to those of the host garnet. Further experiments at higher pressure are in underway, with the aim to achieve full re-homogenization and reproduce the system garnet+melt present during anatexis.

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