

Very dry lower crust beneath the central part of the Carpathian-Pannonian region: The role of Miocene extension induced melting

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The internal part of the CPR is a young extensional basin, which was formed during the Miocene. The central part of the area went through considerable thinning during this extension, when the crust was thinned from its original 50-60 km thickness to the present 25-30 km. The lower crust was sampled by alkaline basaltic volcanoes after the Miocene extension.

The granulite xenoliths entrained in these basalts may bear imprints of this preceding extension event. The studied lower crustal xenoliths are metapelites and metabasic rocks having most commonly granoblastic texture. The rock-forming minerals (garnet, pyroxenes, feldspar, sillimanite, rutile) were measured by micro-FTIR spectrometry to determine their 'water' content and its substitution mechanism. The NAMs in granulites have usually very low 'water' content with bulk water contents typically below 100 ppm. In particular garnet is absolutely dry in all but four xenoliths. Feldspar and orthopyroxene show water contents typically below 100 ppm. The most 'water' rich minerals are clinopyroxene and sillimanite containing usually more than 100 ppm water.

These concentrations are generally much lower than those have been reported for other lower crustal granulites from China [1] [2]. The very low 'water' content of NAMs in lower crustal granulite xenoliths from the central part of the CPR may be the consequence of the Miocene thinning. The accompanying localized fluid infiltration and potential increase in temperature may have resulted in heterogeneous melting and melt extraction from the lower crust having left behind a generally very dry residue. In summary the studied granulite xenoliths highlight that the lower crust in young extensional settings may be generally much depleted in 'water'.

[1] Yang et al. (2008) *Journal of Geophysical Research-Solid Earth* **113**. [2] Zhang et al. (2015) *Gondwana Research* 10.1016/j.gr.2014.12.009