

# **HP/UHP metamorphism with granulite facies overprint from the Moldanubian zone (European Variscides)**

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The Moldanubian zone is characterized by the presence of large amounts of felsic granulites, numerous tectonic bodies of garnet peridotite and eclogite occurring within or adjacent to migmatites and gneisses. Origin of these rocks is not well clear as they are interpreted to be formed by subduction process or represent mantle and subcrustale material exhumed by extrusion from an orogenic rote. No coesite or diamond has been found yet, but mineral composition and thermodynamic calculations from eclogite and garnet peridotite indicated pressures conditions at transition into coesite stability field. Garnet with prograde zoning profile or containing inclusions of magnesiotaramite suggest relation of these rocks to subduction of crustal and upper mantle rocks that underwent metamorphism at HP/UHP conditions. Increase of pressure conditions in peridotite is confirmed by inclusions of spinel in garnet.

The granulites give pressure of 2 GPa and 900 °C, although some of them contain lenses of eclogite giving pressure more than 3 GPa. All HP metamorphic rocks reveal granulite facies overprint in various degrees that resulted in formation of low-pressure mineral assemblages. The main minerals in granulite are quartz, ternary plagioclase, K-feldspar garnet and kyanite. Rarely observed prograde zoning garnet with relatively high Mn in core and inclusions of phengite in garnet suggest prograde history before granulite facies overprint. Some granulites are crossed cut by granitic veins containing garnet and kyanite, indicating HP partial melting. The mineral reaction history combining with the pseudosections constrained for felsic granulite indicate a prograde history in the kyanite-muscovite stability field to pressure more than 2 GPa/800 °C followed by heating and decompression that resulted in partial melting at high pressures. Similar to that in eclogite and garnet peridotite, garnet from granulite shows diffusion zoning resulted from rapid cooling.

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