

**ULTRAHIGH-PRESSURE ECLOGITES FROM POHORJE MTS.
(EASTERN ALPS, SLOVENIA)**

VRABEC, M. ¹, JANÁK, M. ², LUPTÁK, B. ²,
FROITZHEIM, N. ³ & KROGH RAVNA, E.J. ⁴

¹University of Ljubljana, Department of Geology, Askerceva 12, SI-1000 Ljubljana, Slovenia

²Geological Institute, Slovak Academy of Sciences, Dúbravská 9, P.O. Box 106, 840 05 Bratislava 45, Slovakia

³Geologisches Institut, Universität Bonn, Nussallee 8, D-53115 Bonn, Germany

⁴Department of Geology, University of Tromsø, N-9037 Tromsø, Norway

e-mail: geolmjan@savba.sk

Ultrahigh-pressure (UHP) metamorphism in the Eastern Alps has been recently documented in the eclogites from Pohorje Mts. of Slovenia (JANÁK et al., 2004). These eclogites occur in the southeastern part of Pohorje, near Slovenska Bistrica. The country rocks of eclogites are metaultrabasites (predominantly serpentinised dunite and harzburgite with garnet peridotite remnants), amphibolites, orthogneisses, paragneisses and micaschists. These rocks belong to the Lower Central Austroalpine basement unit of the Eastern Alps, exposed in the proximity of the Periadriatic fault.

Kyanite eclogites consist of garnet, omphacite, kyanite and zoisite as major primary phases. Garnet is unzoned with 48 - 53 mole% of pyrope and 19 - 22 mole% of grossular. Non-stoichiometric supersilicic omphacites contain up to 8 - 10 mole% of Ca-Eskola molecule. Their breakdown during decompression resulted in exsolution of quartz rods that are oriented parallel to omphacite c-axis. Phengites contain up to 3.5 Si p.f.u. Quartz inclusions in garnet, omphacite and kyanite are surrounded by radial fractures and exhibit microtextures diagnostic for recovery after coesite breakdown. Secondary phases occur in the coronas, symplectites and fractures. These are diopside, amphibole and plagioclase after omphacite, biotite and plagioclase after phengite, and sapphirine, corundum, spinel and anorthite after kyanite. Pressure and temperature conditions for the formation of the peak metamorphic mineral assemblages have been assessed through a consideration of a) Fe^{2+} -Mg partitioning between garnet and omphacite, b) the equilibrium between garnet + clinopyroxene + phengite ± kyanite ± quartz / coesite assemblage. Calculated peak pressure and temperature conditions of 3.0 - 3.1 GPa and 760 - 840 °C are well within the coesite, i.e. the ultrahigh-pressure stability field. This is consistent with UHP metamorphic conditions recorded in the garnet peridotites from the same area (see JANÁK et al., this issue).

UHP rocks in Pohorje record the highest-pressure conditions of Eo-Alpine metamorphism during the Cretaceous orogeny in the Alps, implying a very deep subduction of the continental crust to at least 90 - 100 km depths. Subduction was intracontinental, dipping to the south or southeast; north-western parts of the Austroalpine (Lower Central Austroalpine) were subducted under south-eastern parts (Upper Central Austroalpine). The subduction zone formed in the Early Cretaceous in the north-western foreland of the Meliata suture after Late Jurassic closure of the Meliata Ocean and the resulting continental collision.

Reference

JANÁK, M., FROITZHEIM, N., LUPTÁK, B., VRABEC, M. & KROGH RAVNA, E. J. (2004): *Tectonics*, **23**, TC5014, doi:10.1029/2004TC001641.