

**PEAK TEMPERATURE VARIATIONS OF THE ECLOGITE IN THE SOUTHERN  
ELCOGITIC MICASCHIST COMPLEX OF THE SESIA ZONE, ITALY**

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This paper briefly introduces the relationship between the peak temperature variation of the eclogite and the geological structure in the Orco Valley area ( $3 \times 5 \text{ km}^2$ ) in the southern part of the Eclogitic Micaschist Complex of the Sesia Zone. The study area covers the northern slope, up to Frassinetto (~ 1000 m altitude) and the southern slope, up to the road cut between Alpette and Cuornè (~ 450 and 1000 m altitude) of the Orco Valley between Pont Canavese and Cuornè (~ 400 and 500 m altitude). In the northern slope, the general strikes are EW-trending and dipping  $40 - 70^\circ \text{ N}$ . Along the Orco Valley, the general strikes are still EW-trending but the dipping becomes almost vertical. In the southern slope, the NS-trending antiform and synform with ca. 1 km wavelength is developed. These data suggest following two structural models; A) Structural discontinuity exists along the Orco Valley, B) the NS-trending antiform and synform in the southern slope is overprinted by regional EW trending antiform and synform. In both cases, lower elevation area of the northern slope, around St. Maria area, (~ 450 - 550 m altitude) is situated lower most horizon in the study area.

In the southern slope, lawsonite-bearing rocks and eclogite intercalate each other. Our textural study suggests the lawsonite was formed during the prograde metamorphism. However, lawsonite is not found along the Orco Valley and in the northern slope, where eclogitic rocks are predominant, i.e. lawsonite-disappearance isograd can be defined in the study area.

Eclogite in the study area is mainly composed of garnet, omphacite, glaucophane, epidote, paragonite, phengite, quartz, titanite and rutile, except for St. Maria eclogite, which lacks epidote and titanite as matrix phases. Omphacite shows homogeneous composition in each eclogite. Garnet generally shows a prograde type zoning with an increase of Mg# ( $= \text{Mg}/(\text{Mg} + \text{Fe})$ ) and a decrease of Mn from the core to the rim, with almost constant Ca and homogeneous rim compositions in most of eclogite. Garnet rim and omphacite pairs give following temperatures, using POWELL (1985) geothermometer, Frassinetto, Pont Canavese and Alpette eclogites give almost identical temperatures,  $482 \pm 14$ ,  $494 \pm 11$  and  $503 \pm 22^\circ \text{ C}$  at 15 kbar, respectively. St. Maria eclogite gives significantly higher temperature,  $550 \pm 18^\circ \text{ C}$  at 15 kbar, than the other eclogite. In the northern slope of Orco Valley, peak metamorphic temperature increases from ca.  $480^\circ \text{ C}$  at Frassinetto to ca.  $550^\circ \text{ C}$  at St. Maria, suggesting the metamorphic grade gradually increases with descending structural level. However, the relationship between the metamorphic grade and geological structure is still ambiguous in the southern slope of the Orco Valley.

**Reference**

POWELL, R. (1985): *Journal of Metamorphic Geology*, 3, 231-243.