The T-t evolution of the Ivrea-Verbano Zone in Val Cannobina

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The Ivrea-Verbano Zone (IVZ) represents an uplifted section of the pre–Alpine intermediate–lower continental crust. It is subdivided in: i) Kinzigite Formation (KF, metamorphic rocks), ii) Mafic Complex (intrusive mafic rocks) and iii) mantle peridotite. The KF consists of amphibolite- to granulite-facies metamorphic rocks. In the northernmost sector of the IVZ (Val Cannobina), the KF is in contact with the External Gabbro Unit (EG) that records Carboniferous to Triassic magmatic and metasomatic events and HT deformation during Triassic-Jurassic time [1]. In order to shed light on the T-t evolution of this sector of the IVZ we studied granulites from the KF occurring as lenses within the EG. Granulites consist mainly of Grt, Plg, Opx, Cpx, Bt (±Qtz), with Ttn, Rut and Zrc as accessories. Rut occurs mainly as inclusion within Grt and can contain Ttn inclusions, the latter occurs also within the matrix. Adopting the thermometer based on the Zr content in rutile [2] and titanite [3] and a P of 1.0 GPa we calculated T of about 888 and 860°C, respectively. These data are coherent with T estimates for the granulitic event obtained from other geothermometers. Preliminary LA-ICP-MS data revealed Permian ages for Zrc and Early-Middle Jurassic ages for Rut and Ttn. Our results and published data suggest that the studied lower crustal sequence experienced a long lasting tectono-thermal evolution with multiple events during Mesozoic as already reported for the IVZ [4].

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