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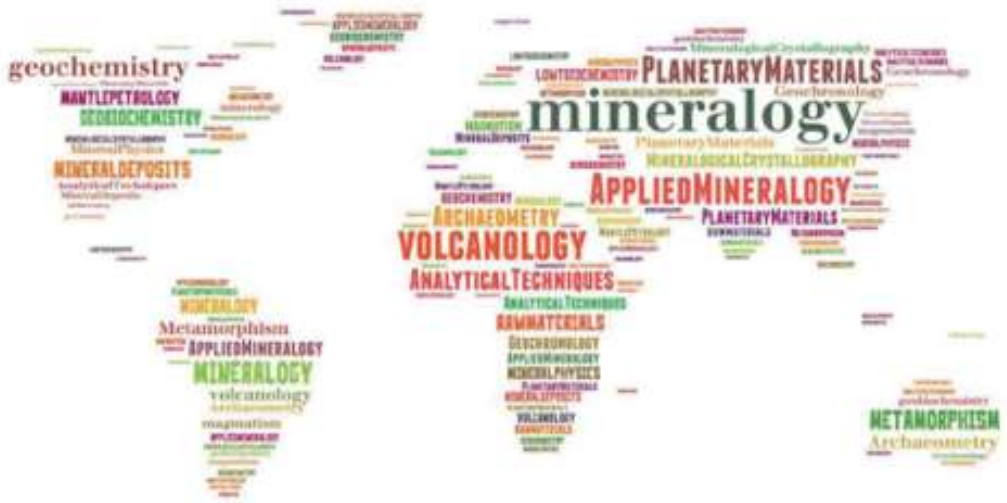
Minerals, rocks and fluids: alphabet and words of planet Earth



Nelle pagine seguenti vengono riportati gli abstract presentati nelle sessioni della seconda European Mineralogical Conference emc2016 "Minerals, rocks and fluids: alphabet and words of planet Earth", che la SIMP ha organizzato a Rimini nel periodo 11-15 settembre 2016.

Dal momento che tutti gli argomenti trattati nella Conference possono interessare i Soci SIMP, gli abstracts inseriti nel volume distribuito ai partecipanti al congresso sono stati riportati integralmente, senza operare selezioni di alcun genere.

Si sottolinea che Plinius non rappresenta in alcun modo – nemmeno parzialmente – il volume ufficiale degli abstract del congresso che rimane quello distribuito in formato digitale ai partecipanti al congresso.

Pertanto la pubblicazione degli abstract su Plinius, è da ritenersi esclusivamente come un servizio utile per i Soci.

Si ringraziano i responsabili editoriali del Volume degli Abstracts di emc2016, Marco Pasero e Bernardo Carmina, per la cortese collaborazione.

DATING THE ONSET OF A LOWER CRUSTAL SHEAR ZONE: A (LUCKY) CASE FROM THE NORTHERN SECTOR OF THE IVREA-VERBANO ZONE (VAL CANNOBINA, ITALY)

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A detailed textural and U-Pb geochronological investigation has been performed on zircons from a ductile shear zone established in lower crustal mafic intrusives. The investigated shear zone is hosted in the Finero mafic-ultramafic complex of the northeastern sector of the Ivrea-Verbano Zone, Southern Alps. It developed at the base of the lower to middle continental crust section, where mafic to ultramafic rocks intruded into a sequence of metapelites and metabasites (i.e., Kinzigite Formation) constituting the polymetamorphic basement of the Adria plate. The shear zone forms a braided belt that can be followed for several km, from the Cannobino River to the Mt. Gridone, and developed entirely within gabbroic/dioritic rocks, partly intruded during Triassic time (~ 232 Ma; Zanetti et al., 2013). The shear zone is characterized by a well-developed foliation, a lineation, and a compositional banding, where amphibole, clinopyroxene and garnet occur as large rounded to elliptical porphyroclasts, resulting embedded in a fine grained matrix mainly consisting of plagioclase, amphibole, pyroxenes and ilmenite. The shear zone was active during uplift and cooling of the wall rock, and recorded retrograde metamorphic conditions ranging from 650 to 500°C at 0.6-0.4 GPa (Kenkmann, 2000). The mylonitic deformation is generally placed no earlier than 230 Ma, lasting until about 170 Ma at the latest (e.g., Handy & Zingg, 1991).

Numerous zircon grains were obtained from the mineral separation of one (~ 2 kg weight) sample collected in the Cannobino River (northern Ivrea-Verbano Zone, Southern Alps). Zircon grains were examined also directly on petrographic thin sections of samples collected throughout the (ultra)mylonitic belt. According to petrographic and microstructural analyses zircon occurs as rounded grains within the mylonitic matrix, easily recognisable due to their dimensions up to 110 µm.

Cathodoluminescence (CL) study at the SEM revealed a well developed systematic zoning of zircon grains with dark cores surrounded by brighter domains, locally asymmetric, and with a thickness up to 30 µm. The dark inner core can show zoning features suggesting magmatic growth.

Preliminary LA-ICP-MS U-Pb results from zircon separates yielded mainly late Triassic concordant ages of about 235 Ma for the dark CL cores and about 204 Ma for the brighter CL (mylonitic) overgrowths.

The sizes, distributions, shapes and CL features of zircon grains provide strong evidence of a metamorphic response of zircon during ductile deformation. The observed features can be interpreted as evidence of dissolution/recrystallization in response to fluid influx during high-temperature shearing.

Further microstructural investigations, mineral chemistry and trace element characterization of different zircon domains are in progress and will provide more evidence for the petrochronological evolution of such a lower crustal shear zone.

Handy, M.R. & Zingg, A. (1991): The tectonic and rheological evolution of an attenuated cross section of the continental crust, Ivrea crustal section, southern Alps, northwestern Italy and southern Switzerland. *Bull. Geol. Soc. Am.*, **103**, 236-253.

Kenkmann, T. (2000): Processes controlling the shrinkage of porphyroclasts in gabbroic shear zones. *J. Struct. Geol.*, **22**, 471.487.

Zanetti, A., Mazzucchelli, M., Sinigoi, S., Giovanardi, T., Peressini, G., Fanning, M. (2013): SHRIMP U-Pb zircon Triassic intrusion age of the Finero Mafic Complex (Ivrea-Verbano Zone, Western Alps) and its geodynamic implications. *J. Petrol.*, **54**, 2235-2265