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ABSTRACT BOOK

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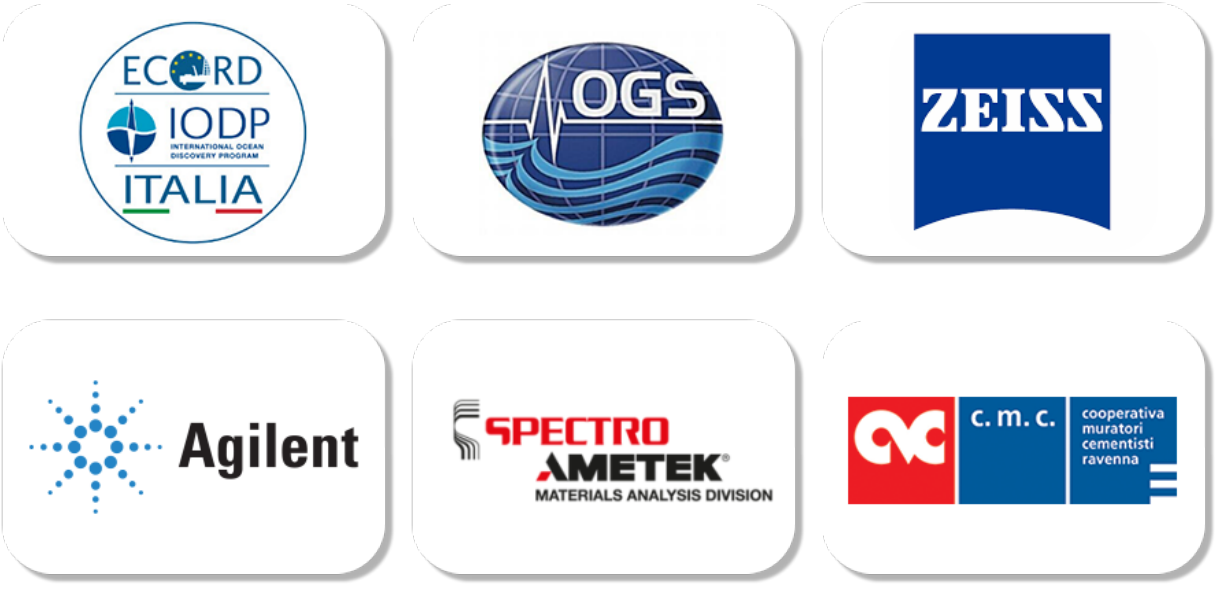

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ABSTRACT INDEX

The Predazzo Intrusive Complex (Dolomites, Southern Alps): thermobarometry, oxybarometry and hygrometry of a shallow multi-pulse intrusion

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The Predazzo Intrusive Complex (PIC) is the most intriguing remnant of the Middle Triassic magmatic systems of the Dolomitic Area (Southern Alps domain). Almost entirely preserved by the Alpine tectonics, this complex is an ideal laboratory for investigating the physico-chemical conditions of magma intrusion in a crustal context, where numerical modelling can be constrained by field evidence. Although volumetrically limited (4.5 km3), PIC is composed by multiple pulses with K-affinity intruded over a short time span. These pulses correspond to the emplacement of amphibole and biotite-bearing silica saturated (pyroxenites/gabbros to syenites), silica undersaturated (gabbros to syenites) and granitic/syenogranitic rocks. To unravel the T-P-fO_2 and H_2O conditions of the various intrusive pulses, we developed a multiple approach, based on the concomitant application of "classical" (i.e. specific for intrusive rocks) and "less conventional" methods (i.e. designed for effusive rocks). Such a process allowed the reconstruction of the entire T-P evolution of the PIC magmas, starting from the generation of the main cumulus phases (clinopyroxene) to the latter crystallization of the intercumulus assemblages, mainly made of amphibole, biotite and K-feldspar. A simulation of the progressively evolving melt compositions enabled us to retrieve their T-P-H_2O paths by means of several thermobarometric, oxybarometric and hygrometric equations (e.g. Burkhard 1991; Anderson 1996; Putirka 2008; Lange et al. 2009; Masotta et al. 2013) and by the application of the Rhyolite-MELTS software (Gualda et al. 2012). In contrast to what proposed in literature, the emplacement of the PIC occurred at shallow depth (< 6 km), in a temperature range of 1000-1100°C to ~600°C and at fO_2 between -0.1 and +0.7 ΔFMQ. H_2O content of less differentiated magmas varies between 1.0-1.5 and 2.0-2.5 wt%. These results, other than confirming what hypothesized by the field evidence, highlight the peculiarity of this complex, which can be considered a snapshot of a shallow crustal magmatic plumbing system.

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