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The linkage of textural and petrological information, and mineral dating is central to understand the evolution of orogenic belts. In this regard, the relation between zoned metamorphic minerals, that define *P-T* paths, and accessory minerals, that provide geochronological information, is a source of uncertainties, which in turn will affect the quality of the reconstruction of lithospheric processes. In this contribution, a complex polymetamorphic history of a rock is deciphered on the basis of replacement microstructures of monazite, chemical variations in garnet porphyroblasts, and a detailed study of the garnet inclusion mineralogy combined with investigations of element partitioning between garnet and accessory minerals such as REE-rich minerals.

Garnet-bearing metapelites of the Micaschist Complex drilled in the Pontremoli 1 well belong to the Variscan basement of the Northern Apennines (Italy). Samples of these rocks contain coronitic microstructures around monazite grains, consisting of an apatite ring, allanite shell and epidote rim. Garnet porphyroblasts, which show a typical prograde growth zoning, enclose xenotime, allanite and epidote in their inner core, outer core and rim, respectively. Discontinuous variation of Y may be attributed to garnet growth during xenotime breakdown. Moreover, the Ca and P chemical profiles in garnet indicate a simultaneous crystallization of the inner core of garnet and apatite. The garnet composition can thus record modifications in the accessory mineral assemblage. The microstructure and chemistry of the monazite grains suggest that the monazite was an early mineral and underwent partial to total decomposition at peak metamorphic conditions. The chemical age of 296 ± 6 Ma should be older than the garnet-forming metamorphic stage.

Thermodynamic modelling permitted also to obtain a counterclockwise *P-T* path for the studied sample: the prograde evolution developed to a metamorphic peak close to 600°C and 7 kbar, and was followed by the peak pressure stage at 520°C and 8 kbar during which Mg-rich muscovite and chlorite with decussate structure crystallize. The replacement of early monazite by apatite, allanite and epidote, inferred through a correlation with the garnet isopleth *P-T* constraints, occurred during the prograde evolution at 500-600°C and 5-7 kbar. A nearly isobaric cooling is responsible for the late observed stage at 500°C and 2 kbar.

The obtained *P-T* path is different from the previously proposed trajectories for the Variscan basement of the Northern Apennines. The tectonic implications of this polymetamorphic evolution will be discussed.