



Petrology of HP/LT metapelitic rocks of an accretionary wedge, the Central Pontides, Turkey: evidence for tectonic stacking and syn-subduction exhumation

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Cretaceous HP/LT chloritoid-bearing metapelitic rocks crop out widely in the central part of the Pontides, northern Turkey. They are associated with eclogite to blueschist-facies metabasites and represent deep levels of an underplated subduction-accretion complex, which is tectonically overlain by low-grade HP phyllite/metasandstone intercalation along an extensional shear zone. Close to the shear zone, the footwall micaschists consist of quartz, phengite, paragonite, chlorite, rutile with syn-kinematic albite porphyroblast formed by pervasive shearing during exhumation. This type of micaschists is tourmaline-bearing and their retrograde nature suggests high-fluid flux along shear zones. Peak metamorphic assemblages are partly preserved in the chloritoid-micaschist farther away from the shear zone. Three peak metamorphic assemblages are identified and their PT conditions are constrained by pseudosections produced by Theriak-Domino and by Raman spectra of carbonaceous material: 1) garnet-chloritoid-glaucophane with lawsonite pseudomorphs (P: 17.5 ± 1 Kbar, T: 390-450 °C) 2) chloritoid with glaucophane pseudomorphs (P: 16-18 Kbar, T: 475 ± 40 °C) and 3) relatively high-Mg chloritoid (17%) with jadeite pseudomorphs (22-25 Kbar; T: 440 ± 30 °C) in addition to phengite, paragonite, quartz, chlorite, rutile. The last mineral assemblage is interpreted as transformation of the chloritoid + glaucophane assemblage to chloritoid + jadeite paragenesis with increasing pressure. Absence of tourmaline suggests that the chloritoid-micaschist did not interact with B-rich fluids during zero strain exhumation.

Peak metamorphic assemblages and PT estimates suggest tectonic stacking within wedge with different depths of burial. $^{40}\text{Ar}/^{39}\text{Ar}$ phengite age of a pervasively sheared footwall micaschist is constrained to 100.6 ± 1.3 Ma and that of a chloritoid-micaschist is constrained to 91.8 ± 1.8 Ma suggesting exhumation during on-going subduction. Coupling and exhumation of the distinct metamorphic slices are controlled by decompression of the wedge possibly along a retreating subduction.