Eocene migmatite formation and diachronous burial revealed by petrochronology in NW Himalaya, Zanskar

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In this contribution we highlight the importance of in-situ monazite geochronology linked to *P–T* modelling for identification of timescales of metamorphic processes. Barrovian-type micaschists, migmatites and augengneiss from the SE extremity of the Gianbul dome have been studied in order to correlate the early stages of Himalayan metamorphism at different crustal levels and infer the timing of anatexis. *P–T–t* paths are constrained through combined pseudosection modelling and in situ and in mount monazite and xenotime laser ablation–split-stream inductively coupled plasma–mass spectrometry (LASS). Petrography and garnet zoning combined with pseudosection modelling show that grt-st schists record burial to ~630–660 °C, 7 kbar; st-ky schists to ~670–680 °C and 7–9 kbar; and grt-ky migmatites to >750 °C and >9 kbar. The grt-st schists indicate cooling on decompression, reequilibration occurred in the st-ky schists at ~600–670 °C and 4–6 kbar, in grt-ky migmatites at ~670–700 °C and 6 kbar, with local growth of and-crd. BSE images and compositional maps of monazite show variable internal structures from homogeneous through patchy zoning with embayed to sharp boundaries. Two grt-st schists–recorded only ~31–27 Ma ages in porphyroblasts and no ~40 Ma ages. The st-ky schist, grt-ky migmatites, augengneiss, have both the older, ~44–37 Ma ages in porphyroblasts and younger ages down to ~22 Ma. These significantly different ranges from porphyroblasts of 44–37 Ma, and 31–27 Ma, are interpreted as the duration of prograde *P–T* paths, and indicate diachronous two-stage burial of rocks. Early migmatization occurred at 38 Ma. The c. 29 Ma is interpreted as the time when rocks from the lower and middle crustal levels were partially exhumed and came in to contact with rocks that were downgoing at this time. Localized monazite recrystallization is as young as 26–24 Ma. The youngest ages of 23–22 Ma are related to leucogranite emplacement.

Mots-Clés : Monazite dating and REE; monazite growth and recrystallization; prograde and retrograde *P–T–t* path; Zanskar Himalaya; Eohimalayan metamorphism

Merci de ne rien inscrire dans cette zone et ne pas modifier les marges des pieds de page et entêtes.