Constraining the age of peak metamorphism and exhumation in the Nagaland ophiolite complex (northeast India) using dynamically recrystallized carbonate veins

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The current understanding of the tectonic significance of metabasites within the Indo-Myanmar ophiolite belt, northeast India, is unclear due to a lack of systematic petrological study and the paucity of reliable age data. We present new petrological modelling results and geochronological data for four samples of blueschist from the Nagaland complex of the Indo-Myanmar ophiolite belt, which provide new insight into the timing and conditions of metamorphism and exhumation during the closure of the Tethys Ocean. Phase equilibrium modelling indicates that two relatively undeformed samples equilibrated at peak metamorphic conditions of ~1.9 GPa and ~420–560 °C, indicating their subduction to ~60 km depth. Two sheared and recrystallized samples equilibrated at ~0.6 GPa and ~470 °C during retrograde metamorphism associated with their obduction onto the Indian foreland.

The timing of these tectonometamorphic events has been established by U–Pb *in-situ* analysis of carbonate grains in all samples. Calcite within dynamically recrystallized shear bands that cross-cut metamorphic fabrics constrains the timing of peak subduction to c. 95 Ma and subsequent exhumation to c. 89–90 Ma. These data demonstrate that the area experienced rapid exhumation at a rate of ~1.1 cm/year, which is notably similar to the reported exhumation rate of the eastern Himalayan syntaxis. This work demonstrates a new technique for dating the timing of exhumation in rocks that lack common U- and Th-bearing minerals.