# P–T evolution of amphibolites from Songduo high pressure metamorphic belt, Lhasa block: constrains from phase equilibria modelling

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High-pressure amphibolite from orogenic belt is an important rock for decoding metamorphic processes. Three amphibolite samples from Songduo metamorphic belt were studied with phase equilibria modelling in order to obtain the metamorphic P–T path. The garnet exhibits two-stage growth characteristics with increasing pyrope and grossular content from core to rim. Phase equilibria modelling suggests that the garnet core grew on the breakdown of chlorite and glaucophane together with epidote at ~500–550 ºC and ~1.8–1.6 GPa. The garnet rim grew on the breakdown of epidote and clinopyroxene at >~550 ºC and ~1.6–1.4 GPa. The garnet and the epidote decomposed to form hornblende and plagioclase with decreasing P and T, probably during the retrograde stage. The omphacite-bearing amphibolite has an analogous P–T path with that of the garnet-bearing sample. Garnet and omphacite are absent in the highly retrograded amphibolite sample, indicating a retrograde reaction: omphacite + garnet + epidote – hornblende + plagioclase + quartz. The difference of the mineral assemblages reflects the distinct compositions of the protoliths. The difference of P–T metamorphic paths for the eclogites and blueschists of intimate occurrence in the same high-pressure belt indicate that this region likely comprises different slices, which had distinct P–T histories and underwent high-pressure metamorphism at different times.