## Metamorphic Evolution of High/ultra High-pressure Pelitic–felsic Schists in the South Tianshan Orogen, NW China: Phase Equilibria and P-T path

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The South Tianshan HP-UHP belt in China is mainly composed of felsic-pelitic schists and blueschists, which enclose lenses and blocks of eclogite, ultramafic rock and marble. It is inferred to constitute a subduction complex within an accretionary wedge, developed along an active continental margin. The blueschists and eclogites have been dated as 305 - 345 Ma. The extensive pelitic-felsic schists preserve two generations of garnet-bearing mineral assemblages: (1) an early generation that involves garnet, phengite, glaucophane, and quartz/coesite with or without paragonite; and (2) a late generation that involves albite, hornblendic amphibole, quartz and grossular-rich / pyrope-poor garnet. Early generation garnet has growth zoning involving core to rim increases in pyrope content coupled with increased or constant grossular content. Pseudosection modeling of these growth zoning textures in three samples (T311, T314, and T316) reflects prograde paths and peak conditions involving c. 32 kbar at 550-570°C, c. 22.5 kbar at 550°C, and c. 22-23 kbar at 540–550°C, respectively. These P-T estimates are consistent with those recovered from eclogite blocks hosted by the schists. Phase equilibrium modeling predicts that the early garnet would have mainly grown in mineral assemblages involving lawsonite, jadeite, and chloritoid, with or without, coesite or carpholite, distinct to the assemblages now in the matrix. The post-peak decompression of the pelitic-felsic schists is inferred to have involved two stages. The early-stage decompression is characterized by dehydration reactions involving lawsonite and carpholite at P>20 kbar, coupled with mode and compositional changes of garnet, glaucophane and phengite. The late-stage decompression after lawsonite disappearance led to the rocks being fluid-absent. Under such fluid-absent conditions, the solid transition of jadeite to albite occurs at  $P \approx 14$  kbar, and hornblendic amphibole forms at 12–13 kbar. Most garnet grains are somewhat changed in composition, to produce a pyrope-poor and grossular-rich outer rim. Unlike that above the solidus conditions, decompression of the pelitic-felsic schists at subsolidus conditions does not destabilize phengitic muscovite and tends to preserve their peak mineral assemblages if there is no intensive fluid-infiltration. In the South Tianshan belt, buoyancy of subducted metasediments with respect to mantle rocks could be one of the major reasons for fast exhumation of the HP- UHP rocks.