



Timing of tectonic events and crustal-scale structure of South Kyrgyz CAOB

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The main phases of tectonic collage of blocks and activation of post-collisional Talas-Ferghana strike-slip fault (TFF) are investigated in the Kyrgyz Central Asian Orogenic Belt (CAOB), by a combined field, metamorphic and Ar/Ar study. The field work conducted on the southern suture of the Middle Tian Shan to the East of the TFF highlights a south-dipping structure featured by a HP metamorphic core complex comprised of c. 320 Ma continental and oceanic eclogites exhumed by top-to-North motion. A large massif (10 x 50 km) of continental HP rocks is evidenced in the Atbashi Range (South Tian Shan, Kyrgyzstan). Its structure and metamorphic history are investigated to reconstruct the geodynamic evolution of the northern rim of South Tian Shan and Tarim block in the Upper Paleozoic. This study gives insights into the crustal-scale structure of this mountain belt, currently intensely reactivated by the India-Asia collision. Metamorphic units exhibit blueschist to eclogite facies conditions. Evidence for eclogite facies in both acidic and mafic lithologies and geological structure are in agreement with a previously thinned continental margin. Prograde stage (I) begins in blue-schist/eclogite facies transition at $520 \pm 30^\circ\text{C} - 17 \pm 1 \text{ kbar}$. Conditions of peak metamorphism (II) in eclogite facies range from $550 \pm 30^\circ\text{C} - 18.5 \pm 1 \text{ kbar}$ to $540-595^\circ\text{C} - 21 \text{ kbar}$. Retrograde stage (III) condition is also in the eclogite facies conditions at $515 \pm 30^\circ\text{C} - 16.7 \pm 1 \text{ kbar}$. Subduction of this thinned COT (Continent-Ocean Transition) probably occurred by slab pull in a south-dipping subduction zone, while another north-dipping subduction was active below Middle TianShan. Final stacking of Middle and South TianShan occurred at 320-310 Ma. These antithetic subduction zones are still reflected in the main structures of Tian Shan. Reactivation of the South-dipping structures since 30 Ma is ascribed to explain the current TianShan intra-continental slab inferred from seismology. After this accretionary episode, the suture southern was cross-cut by the TFF, which first stage of activation occurred at $312 \pm 4 \text{ Ma}$, followed by a main stage of dextral motion in the Late Permian at 256 - 250 Ma. A late stage of reactivation of TFF is featured by emplacement of $195 \pm 3 \text{ Ma}$ pegmatitic dykes.