BLUESCHISTS FROM QINGSHUIGOU IN NORTH QILIAN MOUNTAINS, CHINA

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The North Qilian belt is a collision suture zone between Alashan and Qaidam blocks. Two blueschist belts occur in Middle Cambrian and Lower Ordovician strata. The blueschists from Qingshuigou belt, occurred in Middle Cambrian ophiolite, are located close to the southwest boundary of the North Qilian Mountains and mainly contain glaucophane, garnet, white mica, clinozoisite, chlorite, piedmontite and ardennite, and suffered multiple metamorphism. The estimated peak P-T conditions of the blueschists are 10 kbar, 470-490oC. The white mica 39Ar/40Ar cooling age are 365.5-447.5 Ma (total fusion age of single grain) and 445.7-453.9 Ma (integrated age of multiple grain) which represent different metamorphic events. The first ages should represent retrograde metamorphism events and the second should represent the cooling age after peak metamorphism. The metamorphism shows a typical clockwise P-T-t path that is interpreted to represent a subduction evolution process. We conclude that the North Qilian ocean began to subduct in the Middle Ordovician. An ophiolitic melange belt accompanied by blueschist facies metamorphism formed 453.9 Ma. During the subduction, the ocean crust subducted first to the depth with 8-10 kbar and 326-339oC, and suffered initial metamorphism with peak pressure. Sequentially, the ocean crust subducted very slowly or almost stay at the same depth and underwent an isobaric heating process to reach the peak temperature, then the subducted ocean crust began to exhume and to cool (442.1-453.9 Ma) with decreasing pressure and suffered retrograde metamorphism during 365.5-447.5 Ma.