



Geochronology of Altyn Strike-slip Fault and the uplifting of the Altyn Mountains, western China

Y.J. Liu (1), F. Neubauer (2), X.H. Ge (1), J. Genser (2), S.H. Yuan (1), L.H. Chang (1) and W.M. Li (1)

(1) College of Earth Sciences, Jilin University, Jianshe Str. 2199, Changchun 130061, Jilin, China (yjliu@mail.edu.cn), (2) Dept. Geography and Geology, Salzburg University, Austria, Salzburg, A-5020

The reported isotopic ages in the Altyn strike-slip fault belt and the neighboring areas show several different age groups, which are 25-40 Ma, 85-100 Ma, 160-180 Ma, 210-270 Ma, 350-400 Ma and 430-530 Ma. The old age groups are mainly dated from the samples of the Proterozoic metamorphic rocks that were most likely displaced from Northern Qilian belt and the Northern Qaidam belt, therefore, the ages should represent the pre-Altyn-strike-slip-fault tectono-thermal events occurred in Qilian belt and the Northern Qaidam belt. According to the $^{40}\text{Ar}/^{39}\text{Ar}$ dating of the syntectonic-growing minerals from the samples within the Altyn strike-slip fault belt and the offset estimations by different age piercing points, we suggest that the Altyn strike-slip fault should be initiated at Middle Jurassic (178.4-160 Ma).

The modal analyses of sandstone framework components in the western Qaidam Basin indicate that the provenance of the Cenozoic system is mainly recycled orogenic belt, secondly the mixed provenances of transitional continent basement uplift, dissected arc and transitional arc. The paleocurrent indicates that the provenance mainly come from the Altyn Mountains.

The different contents of the sandstone framework components between Xiangan-chaiyou and Shangganchaigou Formations in the western Qaidam basin can be observed. With time the quartz component decreased and the clastic component increased with more unstable minerals and worse sorting degree, which suggest that the Altyn Mountains began to uplift in Oligocene (Shangganchaigou Formation). The strong uplifting began in the Miocene according to the evidences from the seismic sec-

tion of the western Qaidam basin and sedimentary velocity of the Qaidam and Tarim basin. The last strongest event in the end of Early Pleistocene according to the unconformity between the Qigequan Formation (from the end of Pliocene to the beginning of Early Pleistocene) and the overlying sediments (Middle Pleistocene).

The detrital biotite laser $^{40}\text{Ar}/^{39}\text{Ar}$ ages from Xiaganchaigou and Shangganchaigou Formations in the western Qaidam basin show several different groups, which are 20-40 Ma, 60-80 Ma, 140-160 Ma, 180-200 Ma and 240-260Ma. The most of ages are essentially coincident with the tectonothermal events which have been reported in the mountain belt. But the detrital mineral ages of the Qigequan Formation recorded pre-Mesozoic tectonothermal events. This suggests that the pre-Mesozoic rocks had not been exhumed to the surface till the Qigequan Formation period.

The study shows that the Altyn strike-slip fault is characterized by multiple re-activities as recorded by the younger age groups after initiation at Middle Jurassic under the tectonic setting of convergence between the Indian and Eurasian continents.