

Petrogenesis and tectonic significance of Shuangjianshan highly evolved I-type granite, Beishan orogen, NW China

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We have studied the petrology, major and trace element geochemistry, isotope geochemistry of the Shuangjianshan intrusion and discussed its petrogenesis and tectonic significance. The Shuangjianshan intrusion is located in south of Hongshishan ophiolitic mélangé in Beishan orogeny belt, Gansu, north of Tarim. It is a monzogranite. The content of SiO₂ is 73.04-74.39 %, A/CNK ranges from 0.996 to 1.065, total alkalis ranges from 8.29 to 8.44 % with Na₂O over 3%, calculated corundum is less than 1 % and DI ranges from 91.29 to 93.26. Thus, it is a highly evolved I-type granite with total REE (146.79-157.5 ppm), (La/Yb)_N (8.08-8.80) and δEu (0.64-0.73). It is enriched in Rb, Ba, Th, U and depleted in Ta, Nb, Sr, Ti. Its geochemistry characters show the affinity of island arc magmatic rock. LA-ICP-MS zircon U-Pb dating gave the intrusive age of 322.3±1.7Ma (weighted ²⁰⁶Pb/²³⁸U age). Its has high εNd (t) (+1.9 to +2.7), low (⁸⁷Sr/⁸⁶Sr)_i (0.70312 ~ 0.70343) and the samples from the intrusion plots in the orogeny evolution trend on the ²⁰⁶Pb/²⁰⁴Pb vs. ²⁰⁷Pb/²⁰⁴Pb diagram. It falls in the area of syn-collisional granite area on R1-R2 diagram, however in the volcanic arc granite area on the Y vs. Y+Nb and Y vs. Nb diagrams. The characteristics described above indicate that the Shuangjianshan intrusion is a highly evolved I-type granite originating from the mantle wedge. Trace elements exhibit the characteristics of subduction zone. The granite also contaminated by crust and underwent highly fractional crystallization. Combining with the 334 Ma adakite, we believe that the intrusion is a later product of the subducted North Tianshan ocean crust, which closed before 322 Ma and then came to the syn-collisional stage.

This work is funded by 305 Project of State Science and Technology Support Program (Grant No. 2007BAB25B04).

Quaternary soil and climate change inferred from TL Dating of Quaternary terraces in Taleghan basin, Iran

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Introduction and methods

We report the first thermoluminescence ages for the quaternary sediments of the Taleghan Drainage Basin, Tehran, Iran.

Results

Terraces	Terrace Name	Age (y)
Q4	Toria War	4650+ 520
Q3	Wurm	9100 ± 800
Q2	Wurm	15600 ± 2000
Q1	Riss	54900± 8700

Table1. Result of TL dating [1, 2]

The carbonates appeared in the field as nodules in the wurm terrace and laminar or conglomeratic massive cemented accumulation (Petrocalcic horizons) in the Riss terrace and the Toria war (youngest terraces), rejuvenates by flooding, and has not secondary carbonate within the profile.

Discussion

Based upon the above observations, we theorize that, at the ~100 ky ago climate was cold and arid, at the ~15 ky ago climate was tardi glacial, at the ~9 ky ago climate was pluvial and temperate with arid transitions and at the ~4 ky ago climate was flooding [3].

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[2] Shannon, M. (2000) (USGS) October 13, 2000.
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