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阿尔金环形山花岗片麻岩同位素年龄及成因研究

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摘要:

阿尔金中段环形山二长花岗片麻岩LA-ICP-MS锆石U-Pb年龄为 928 ± 9 Ma。岩石SiO₂含量为72.26%~74.34%,全碱(Na₂O + K₂O)为7.22%~8.32%,Al₂O₃含量为12.40%~13.51%,含量较高;MgO为0.43%~1.07%,FeO^T为2.09%~2.43%,CaO为1.02%~2.03%,TiO₂为0.19%~0.32%,含量较低。岩石FeO^T/MgO比值为2.28~4.87和Al₂O₃/TiO₂比值为40.4~69.0(均小于100)、CaO/Na₂O比值为0.46~1.06(大于0.30)、K₂O/Na₂O比值为2.10~3.43(大于1),富集大离子亲石元素Rb、Th、K及La等,亏损Ba、Ta、Nb、Sr、P、Ti,Th/U比值为5.17~14.7、Zr/Hf比值为30.3~34.3,ΣREE总量平均为 193×10^{-6} , (La/Yb)_N为3.89~5.00(小于10),δEu<0.5,这些均显示S型花岗岩地球化学特征。低Sr/Ba比值(0.12~0.2)和低的Mg[#]值(平均值36.2),具有负Eu异常,显示其源岩区与泥质岩、基性岩的关系不大;0.4

英文摘要:

The LA-ICP-MS zircon U-Pb isotopic dating on the Huanxingshan monzogranitic gneiss from the middle Altyn Tagh reveals a U-Pb mean age of 928 ± 9 Ma, which approximately represents the intrusive age of the granitic. Geochemical characteristics of major elements exhibit the granite with high SiO₂ (72.26%~74.34%), Na₂O+K₂O (7.22%~8.32%) and Al₂O₃ (12.40%~13.51%) contents, and low MgO (0.43%~1.07%), FeO^T (2.09%~2.43%), CaO (1.02%~2.03%) and TiO₂ (0.19%~0.32%) contents. FeO^T/MgO (2.28~4.87) and Al₂O₃/TiO₂ (40.4~69.0) ratios are less than 100, while CaO/Na₂O (0.46~1.06) and K₂O/Na₂O (2.10~3.43) ratios are more than 0.3 and 1, respectively. These characteristics are similar to values of typical S-type granite. Th/U and Zr/Hf are 5.17~14.7, 30.3~34.3. Additionally, the granitic gneisses are characterized by relative enrichment in Rb, Th, K, La, and depletion in Ba, Ta, Nb, Sr, P and Ti, which indicate monzogranitic gneiss may be product of Partial melting of sedimentary rocks. All the samples are slightly enriched in LREE with (La/Yb)_N ratios ranging from 3.89 to 5.00 (less than 10). In the chondrite normalized REE patterns, all the granitic gneiss show clear negative Eu abnormalities (δEu<0.5). These characteristics suggest the rock is S-type granite. Their low Mg[#] (36.2, in average), Sr/Ba (0.12~0.20) ratios and Eu depletion indicate that the primary magma was derived from partial melting of greywacke rather than muddy rock and basic rock, under temperature of ca.789~803°C and pressure 0.8~1.6GPa. Based on all above element and isotope geochemistry, it is reasonably suggested that the Huanxingshan granite in Altyn Tagh was formed in a syn-collision tectonic setting at Early Neoproterozoic era.

关键词: [同位素年代学](#) [地球化学](#) [二长花岗片麻岩](#) [阿尔金](#)

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