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新疆西准噶尔达拉布特蛇绿岩E-MORB型镁铁质岩的地球化学、年代学及其地质意义

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摘要:

新疆西准噶尔地区是古生代经过俯冲-增生形成的复合造山带, 该地区分布有多条蛇绿岩带, 其中之一的西准噶尔达拉布特蛇绿岩被认为是最大的一条蛇绿岩带, 可能代表了古亚洲洋壳的残余。本文的资料显示蛇绿岩带内的镁铁质岩呈现出N-MORB、E-MORB和似OIB的地球化学特征, 通过对阿克巴斯套岩体中的浅色辉长岩LA-ICP-MS锆石年龄测定, 获得达拉布特蛇绿岩E-MORB型镁铁质岩的年龄为 302 ± 1.7 Ma。鉴于达拉布特蛇绿岩中E-MORB和似OIB型镁铁质岩成因的复杂性, 结合前人研究成果, 对辉长岩锆石U-Pb年龄所代表的意义存在两种可能性: (1) E-MORB型和似OIB型镁铁质岩可能是弧后盆地扩张后期的产物, 代表蛇绿岩的年龄, 其表明西准噶尔地区可能晚石炭纪还有洋盆存在; (2) E-MORB型镁铁质岩是蛇绿岩消亡阶段由于扩张脊和俯冲带碰撞作用而形成的弧前海山, 形成时代晚于达拉布特主体蛇绿岩, 但其成因与蛇绿岩的演化密切相关。本文倾向于第二种可能性, 认为新疆北部晚石炭-早二叠可能仍存在活动陆缘, 俯冲作用仍然存在, 扩张脊俯冲形成的板片窗效应导致地幔楔、俯冲板片和沉积物等熔融促使基性岩浆向长英质酸性岩浆转变, 从而引发了二叠纪大规模玄武质岩浆底侵, 导致了该时期的构造-岩浆-成矿-造山作用的发生。

英文摘要:

The West Junggar region in northwestern China is an important part of Central Asian Orogenic Belt, which consists of successive subduction-accretion of ophiolites, island arc, oceanic islands, seamounts, accretionary wedges in Paleozoic. A number of ophiolites or ophiolitic melanges were emplaced within this orogenic belt, Dalabute ophiolite, which is one of the largest ophiolite belts in West Junggar, represents the remnants of Paleozoic oceanic crust. Geochronologically, the mafic rocks of Dalabute ophiolite display normal mid-ocean ridge basalt (N-MORB), enriched mid-ocean ridge basalt (E-MORB) and ocean island basalt (OIB) signatures. This paper reports that the LA-ICP-MS zircon U-Pb dating result for E-MORB type leucocratic gabbros from Akebasitao terrane of Dalabute ophiolite, yielding an age of 302 ± 1.7 Ma. Since the more complexity petrogenesis of E-MORB and OIB mafic rocks in ophiolites, combining previous studies, we propose two hypotheses for explanation of gabbro age: (1) E-MORB and OIB type mafic rocks were formed in late stage of back arc extension, the dating represents the formation age of the ophiolite, suggesting the Junggar ocean possibly closed after Late Carboniferous; (2) E-MORB and OIB type mafic rocks were forearc seamount in accretionary prism during the death or emplacement stage of ophiolite, which formed in response to collision of spreading center with Dalabute ophiolite subduction zone. They post-dated formation of main ophiolite sequence, but have significant tectonic implications for the origin and evolution of the Dalabute ophiolite. We favor the latter explanation and propose that there was an active margin during the Late Carboniferous-Early Permian in North Xinjiang. The important cause of tectonic-magmatic-metallogenic-orogenic climax is the subduction of spreading center, by which the large volume of continental crust increased through transfer granitic melt, which were from partial melting of accretionary wedge, subducted slab and recycled sediments triggered by underplating of mantle-derived basaltic magmas, to orogenic belt. This process may be caused by slab window effects following spreading center subduction.

关键词: [准噶尔](#) [达拉布特](#) [蛇绿岩](#) [E-MORB](#) [LA-ICP-MS](#)

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