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西准噶尔晚古生代岩浆活动和构造背景

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摘要:

西准噶尔作为中亚造山带的一部分,吸引了大量学者的关注。蛇绿混杂岩带、花岗岩、中基性岩墙在本地区广泛出现,表明西准噶尔晚古生代构造演化极为复杂。但是在许多方面仍存在很多争议,例如西准噶尔蛇绿混杂岩带的形成时代、岩石组合和岩石成因;I型和A型花岗岩的岩石成因,构造背景和热机制;中基性-酸性岩墙群的年代学、岩石成因、构造背景和古应力场;西准噶尔晚古生代年代学格架和构造背景;西准噶尔显生宙地壳增生;西准噶尔基底特征和西准噶尔晚古生代构造演化等。笔者通过搜集前人的资料和数据,对西准噶尔区域发育的蛇绿混杂岩带、地层、古地理环境、花岗岩体和 中基性岩墙群的总结,结合项目组野外与室内数据的研究,得到以下认识:(1)达尔布特和克拉玛依蛇绿混杂岩的形成环境为与俯冲相关的弧后盆地,源区来自含尖晶石二辉橄榄岩高程度部分熔融作用;(2)早石炭世花岗岩形成于俯冲环境,晚石炭世-早二叠世花岗岩形成于后碰撞环境,中二叠世花岗岩形成于板内环境;(3)I型花岗岩的成因与俯冲密切相关,而A型花岗岩和中基性岩墙产于后碰撞环境下;(4)A型花岗岩是下地壳受地幔底侵发生部分熔融并高度分离结晶的产物,中基性岩墙群普遍具有埃达克质岩的地球化学特点,可能产于受流体(或熔体)交代的残余洋壳板片的部分熔融;(5)中基性岩墙群稍晚于寄主岩体而形成,但两者均形成于后碰撞构造背景。在晚石炭世-早二叠世,西准噶尔处于近南北向的拉张应力体系;(6)西准噶尔在泥盆纪为洋盆体系;早石炭世,俯冲-碰撞过程结束;晚石炭世-早二叠世属于后碰撞环境;中晚二叠世处于板内环境。

英文摘要:

West Junggar, as a crucial part of the Central Asian Orogenic Belt (CAOB), has been paid a lot of attention by numerous scholars. Six ophiolitic mélangé belts, numerous granitoids and mafic-intermediate dyke swarms outcrop in West Junggar, indicating how complex the Paleozoic tectonic evolution of West Junggar is. Although a great of improvements has been made, there are still many controversies, such as the formation time, rock assemblages and petrogenesis of diverse ophiolitic mélangés, the petrogenesis, tectonic setting and thermal mechanism of the I-type and A-type granitoids, the geochronology, petrogenesis, tectonic background and paleo-stress regime of mafic-intermediate dyke swarms, the Paleozoic geochronological structure, the tectonic setting, the Phanerozoic crustal growth, the basement and tectonic evolution of West Junggar, and so on. The author collects the reported data and summarizes on the ophiolitic mélangé, Paleozoic granitoids and intermediate-mafic dyke swarms in West Junggar. Combining with the geological survey and geochemical work, we put forward several cognitions: (1) Daerbute and Karamay ophiolitic mélangés that are derived from high degree partial melting of spinel-bearing Iherzolite, are formed in back-arc tectonic setting related with subduction. (2) C_1 granitoids are the outcomes of subduction, C_2 - P_1 are generated in post-collisional background, while P_2 granitoids are formed in within-plate setting. (3) The petrogenesis of I-type granitoids are subduction-related, while the A-type granitoids and mafic-intermediate dyke swarms are post-collisional background-related. (4) The A-type granitoids are derived from the high degree of fractionated crystallization after the lower crust partial melting induced by upwelling mantle. Geochemically, the mafic-intermediate dyke swarms are featured as adakitic rocks or sanukite, which are most possibly from partial melting of remnant oceanic slab metasomatized by fluids or melts. (5) The mafic-intermediate dyke swarms are formed a little later than that of the host granitoid, both of which are formed in post-collisional background in C_2 - P_1 , suggesting a Paleozoic stress regime with near North-South direction extension. (6) The Paleozoic tectonic settings of West Junggar are oceanic basin system in Devonian, subduction in Early Carboniferous, post-collisional setting in Late Carboniferous-Early Permian and within-plate setting in Middle-Late Permian.

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