

赵燕,第五春荣,朱涛,王洪亮,孙勇. 2015. 敦煌三危山地区晚泥盆世斜长花岗岩的发现及其地质意义. 岩石学报, 31(7): 1855-1869

敦煌三危山地区晚泥盆世斜长花岗岩的发现及其地质意义

作者	单位
赵燕	大陆动力学国家重点实验室, 西北大学地质学系, 西安 710069
第五春荣	大陆动力学国家重点实验室, 西北大学地质学系, 西安 710069
朱涛	中国地质调查局西安地质调查中心, 西安 710054
王洪亮	中国地质调查局西安地质调查中心, 西安 710054
孙勇	大陆动力学国家重点实验室, 西北大学地质学系, 西安 710069

基金项目: 本文受中国地质调查局项目(1212011121137)和西北大学大陆动力学国家重点实验室科技部专项联合资助。**摘要:**

本文报道在敦煌三危山地区发现的斜长花岗岩。斜长花岗岩呈细小脉状、网脉状产出,主要由斜长石(60%~65%)和石英(28%~32%)组成,电子探针分析数据显示斜长石属于钠长石-更长石($Ab=85\sim 99$),主要为更长石。岩石样品具高硅($SiO_2=71.00\%\sim 72.92\%$)、极度富钠、贫钾($Na_2O/K_2O=8.54\sim 11.37$)的特征; $Mg^{\#}$ 较高,介于47~64;稀土元素含量极低,球粒陨石标准化配分曲线呈近乎平坦型分布,轻、重稀土元素均亏损, Eu、Sr正异常。锆石Hf同位素组成显示 $\epsilon_{Hf}(t)$ 为正值,主体介于+3.1~+6.4之间,表明该斜长花岗岩为M型花岗岩。野外地质特征、岩相学特征、地球化学组成和锆石Hf同位素分析均表明该区斜长花岗岩是由起源于亏损地幔源区的洋脊拉斑玄武质熔体中的斜长石堆晶形成的大洋斜长花岗岩,属于蛇绿岩的端元组分,该岩石形成以后经历了后期流体交代作用的改造。LA-ICP-MS锆石U-Pb定年结果显示样品21SWS和SWS05的 $^{206}Pb/^{238}U$ 加权平均年龄分别为 $363\pm 2Ma$ 和 $365\pm 3Ma$,表明该斜长花岗岩形成于晚泥盆世。综合区域地质特征及已有研究成果,提出敦煌地区经历了晚古生代洋盆扩张-俯冲过程,360~370Ma的洋盆扩张可能代表了古亚洲洋南缘弧后盆地的扩张,伴随着新元古代开始古亚洲洋的扩张-闭合过程,敦煌地块很可能卷入到了一系列与古亚洲洋闭合相关的造山活动,最终构成了中亚造山带的一部分。

英文摘要:

Plagiogranites in Sanweishan area, Dunhuang, Gansu Province are investigated for the first time. The plagiogranites, composed predominantly of plagioclase (60%~65%) and quartz (28%~32%), occur as small veins or net-veins. Plagioclase, mainly dominated by oligoclase, belongs to albite-oligoclase set ($Ab=85\sim 99$). Samples studied in this paper are characterized by high SiO_2 (71.00%~72.92%), high Na_2O and low K_2O ($Na_2O/K_2O=8.54\sim 11.37$) contents, with relatively higher $Mg^{\#}$ values ranging from 47 to 64. The chondrite-normalized rare earth element (REE) patterns are characterized by extremely low REE contents with relatively horizontal patterns and positive Eu and Sr anomalies. Analyses on zircon Hf isotopic compositions yield positive $\epsilon_{Hf}(t)$ values varying from +3.1 to +6.4, implying that the plagiogranite belongs to M-type granite. Field geological features, petrology, geochemistry, together with zircon Hf isotope compositions suggest that the plagiogranite in Sanweishan area is oceanic plagiogranite and this plagiogranite, experienced the later fluid interaction, was formed by cumulating of plagioclase in tholeiitic magma, which was derived from depleted mantle. Analyses on the zircon grains yield weighted mean $^{206}Pb/^{238}U$ ages of $363\pm 2Ma$ and $365\pm 3Ma$ for samples 21SWS and SWS05, respectively, indicating that the plagiogranite formed at the Late Devonian. Based on the regional geological features, previous studies and our new data, we propose that Dunhuang area has ever undergone the formation and subduction of ocean basin, and the ocean basin, having begun to develop at 360~370Ma, possibly is the back-arc basin of the southern margin of the Palaeo-Asian ocean; along with development since the Neoproterozoic and closure of the Palaeo-Asian ocean, the Dunhuang block was likely to be involved into a series of orogenic events, and finally became a part of Central Asian Orogenic Belt.

关键词: [三危山](#) [敦煌](#) [斜长花岗岩](#) [晚泥盆世](#) [中亚造山带](#)**投稿时间:** 2014-09-05 **修订日期:** 2014-12-17[HTML](#) [查看全文](#) [查看/发表评论](#) [下载PDF阅读器](#)

黔ICP备07002071号-2

主办单位: 中国矿物岩石地球化学学会

印刷版(Print): ISSN 1000-0569 网络版(Online): ISSN 2095-8927

单位地址: 北京9825信箱/北京朝阳区北土城西路19号

本系统由北京勤云科技发展有限公司设计