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Magma Mixing and Mingling for Xiangjiananshan Granitic batholith at eastern area of the East Kunlun Orogenic Belt

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Abstract

The Changning Menglian belt is an important area of research on the evolution of the Paleo Tethys ocean structure, the belt can be solved such as the Changning Menglian belt position; sequence stratigraphy; sedimentary environment; nature and its tectonic evolution history and tectonic domain and Gut Tis relationship; therefore, the research on Chang Ning Menglian zone have a great significance to solve many problems of the Sanjiang fold belt in Tethys and Himalaya tectonic area. "Hot spring" is located in the west margin of the southern Changning Menglian belt, studying Yunnan Fengqing hot spring group "geological and petrology characteristics roundly and in depth, concluding the metamorphism and deformation characteristics, clarifying the metamorphism effect and its stages, understanding the association its combination with the Changning Menglian belt between, therefore it has the great significance to solve the geological evolution history in the Sanjiang area, especially the paleo Tethyan tectonic belt , as well as Gondwana and Eurasia boundaries and other major problem. Through collect and read the literature data, measurement of field section, geological investigation, research and Study on rock sheet indoor, rock composition test, electron probe testing system, summarize the geological characteristics and petrological characteristics of “hot springs group ", and through the discussion of the geochemical characteristics of rocks, explore its rock assemblages, characteristics of original rock and analysis of metamorphism and deformation stages, to provide basic data for regional geological evolution.

The study shows that the main lithology is biotite quartz schist, mica schist and epimetamorphic sandstone interspersed with a small amount of phyllonite, granulite, silicalite, carbonaceous slate and phyllitic cataclasite that contains some pressure breccia. The metamorphic mineral paragenetic assemblage of the representative rock is: M_1 biotite (Bi) + plagioclase (Pl) + quartz (Q), and M_2 muscovite (Mus) + quartz (Q). The protolith is felsic rock and sedimentary rock that belongs to argiloid. On the basis of comparison, the stratigraphic sequence of the protolith is

consistent with the type section of Wenquan formation. Along with the subduction(Hercynian) - subduction (Indosinian) - orogenic (Yanshan Himalayan period) process of Changning Menglian belt, hot springs group experienced two stages of metamorphism and three stages of deformation, metamorphic temperature at 400-500 ℃, the pressure is foucs on 0.3-0.62Gpa, and shown the retrograde metamorphism of the low greenschist facies.

Geological age of hot springs formation is early Devonian (survey team of Yunnan District three units, 1980),sedimentary environment is mainly shallow and semi deep sea, observed Bouma sequence in rock slice , therefore,the depositional environment may be fan or basin of sea, the sedimentary formations are mainly clastic rock - siliceous rock formation, the upper coal—contained formation. With the Changning Meng Lian ocean expansion, ocean island begin to develop, material deposition continuing , appearing volcano material, the protolith may contain volcano matter through studying the thin section.

To the Late Permian, Crust of Changning Menglian ocean begin to subduct to the east of the Yangtze block , ocean basin began to close,but it still has formation here at this time, mainly shallow carbonate formation, with proceeding of subduction, in the low temperature groove (7Km deep), due to changes in temperature and pressurer, appearing metamorphism (M_1) and deformation (D_1) for the first time, the shear effect produced by deformation lead to

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some cleavage, occurring regional foliation S_1, major metamorphic minerals formed in metamorphism is long flake biotite. The main metamorphic mineral assemblages are biotite (Bi) + feldspar (Pl) + quartz (Q).

Subsequently, crustal uplift, depositional break , because the Changning Meng Lianyang has closed during the Indosinian period, Baoshan - Zhenkang block in the west and the Yangtze block in the east knocked each other. In the Indosinian, under the action of faults ,the hot spring formation clipping and retracing, back to a position about 1-2Km depth, the position is still belongs to the low temperature groove, and occurring axial cleavage in the core of the fold, namely S_2. That is, the emergence of the second metamorphism (M_2) and deformation (D_2). The deformation is affected by the strong pressure , so the rock have dewatered, so the second metamorphic deformation process is affected by temperature (T), pressure (Ps) and fluid (C). The main metamorphic minerals in the second generation of metamorphism is Muscovite, while there have some of biotite formed in same period, find that the first phase of biotite parallel growth of rock slice, namely S_1 parallel S_2, and we can see incomplete metamorphism biotite, so the the Muscovite is formed by the first stage of metamorphism and metamorphic biotite. The main mineral of the second stage metamorphism is Muscovite (Mus) + quartz (Q)

Then, the crust continues to rise, the sedimentary break continues. In the Jurassic Cretaceous start orogeny, namely Yanshan period intracontinental orogeny, occurred third deformation (D_3), under extrusion shearing, S_3 emergencing, after Yanshan intracontinental orogenic period, in Himalayan period there have large-scale nappe structure and differential uplift and faulting. So the third deformation (D_3) strengthened ,with weak metamorphism, sericite emergencing.