

The Domal Metamorphic Terrane in Danba, Western Sichuan China: A Hint on Lithospheric Evolution of Songpan-Garze Orogenic Belt

ZHENDONG YOU¹, SUHUA CHENG¹, XINGYUN LAI³

¹ *China University of Geosciences(Wuhan)*

² *Peking University*

³ *China University of Geosciences(Beijing)*

There are more than ten domal metamorphic terranes in various size, from north southwards, scattering along the west margin of the Yangtze block. The core of the dome is always occupied by Neo- proterozoic(ca 865—785Ma) migmatite gneisses or is emplaced by Mesozoic granites and they are in turn surrounded by intermediate-pressure rocks in various grades of Barrovian metamorphic belts. However, for those domes developed in Yajiang Region, south of Danba, due to the intrusion of granitic bodies, they are surrounded by low-pressure Buchan type of metamorphic belts. In addition, those domes to the southeast of the Danba arc such as Gezong dome together with those located to the south of Muli arc are mostly surrounded by Low -grade metamorphic rocks in greenschist facies lack of prominent index minerals in them. . The migmatites are mostly stromatitic, but occasionally agmatitic which are similar to those developed in the basement of Yangtze block, suggesting the affinity of the basements between Yangtze and Songpan Garze orogenic belt(SGOB). In contrast there are many domes with granite intrusion in its core such as those domes , scattered in the north of Yajiang. Petrochemical and geochemical study of some of these granites showed that they are S-type granites, resulted from the partial melting of the continental crust with volcanic arc or syn collisional geotectonic setting. The grade of metamorphism is higher in the northwestern part of Danba Region(with Sill+ kfs assemblage) and is lower towards the southeast (sericite + chl). It is reasonable to conclude that there is a thermal axis in the south eastern part of the SGOB shown as low -pressure Buchan-type metamorphic belt. Perpendicular to this axis the metamorphic temperature is gradually lowering. The geochronological data published by previous authors showed that the Barrovian prograde metamorphism(M1) was initiated in 210—205 Ma with peak metamorphic stage at 204-190 Ma while the Buchan type metamorphism(M2) is about 164Ma(according to sphene U-Pb dating) which is correspondent with the Zircon U-Pb dating of Manai Granite yielding 197+/- 6 Ma. The lithosphere evolution of SGOB is complicated. The basement complex is Neo-proterozoic which is similar to that of the north margin of the Yangtze continental block . The west margin of Yangtze continental block subducted beneath SGOB in the late Indosinian. The Jurrassic granite intrusions in Danba and the formation of the domal metamorphic terrane is an response to the collision between the 3 adjacent continental blocks(i.e. North China, Yangtze and Tibet) which had resulted in the two- sided constrictions relating to the formation of domal structures. This program is sponsored by NSFC(No.40272032)