



Geochronology, geochemistry, and Sr-Nd isotope compositions of the Shirensan gneiss, North Qinling, central China: Implications for the Mesozoic geological evolution

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The Shirensan block is a complex geological body located in the north of the Qinling Orogenic Belt (QOB). It can be divided into the Taihua Group migmatite, Shirensan gneiss and magmatic rocks from the south to the north. Based on the field investigation, microstructural analysis, zircon U-Pb dating and geochemical analysis, the petrographic features, tectonic age and deformation environment of the Shirensan gneiss are determined. The geochemical features suggest that the Shirensan gneiss belongs to high-K calc-alkaline series A-type granite, which indicate that the gneiss is resulted from intraplate granite formed in the post-orogenic stage. The Sr-Nd isotopic composition suggest that the Taihua Group migmatite and the Shirensan gneiss have the same source material. The source rocks may be low maturity and high argillaceous component of the upper crust. Thus, we deduce the tectonic evolution process of the Shirensan block and its relationship with the Qinling orogenic belt. It can be seen that the Shirensan gneiss was resulted in the melting of the Taihua Group and part of the Kuanping Group, and formed syntectonic magma in the late Caledonian period along with the subduction of the Luonan-Luanchuan fault. During the strike-slip of the Luo-Luan Fault, the tectonic weak zone was emplaced by the syntectonic magma and formed the syntectonic gneiss. In Yanshanian period, due to regional migmatization, a large number of undeformed granites were emplaced into the northern side of the fault. A great deal of heat resulted in the age reset of the Shirensan gneiss and the Taihua group, forming the Yanshanian age. Therefore, the metamorphic and deformed Shirensan gneiss are truly recorded the tectonic activities in the southern margin of the North China Block, and it is of great significance to studying the plate deformation during the subduction.

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