

The Early Cretaceous transcrustal magmatic system in central Sulu orogenic belt and its implication on regional tectonic evolution

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Eastern China has been extensively affected by the subduction of the Paleo-Pacific plate since the late Mesozoic. Sulu orogenic belt formed in the early Triassic by continental collision between the North China Craton and Yangtze Craton. After that, the Sulu orogenic belt suffered a reconstruction by the subduction of the Paleo-Pacific plate. In this period, there is a transcrustal magmatic system developed in our study area. In order to manifest the “reconstruction” process, based on the detailed fieldwork and the simulation of regional tectonic stress field, Zircon U-Pb dating, Petrographic and geochemical studies on these igneous rocks have been carried out by XRF, ICPMS and LA-ICPMS.

In the Laiyang stage (150-125Ma) of early Cretaceous, the regional stress field is NW-SE stretching, mainly caused by the extensional collapse of the orogenic belt with the “de-rooting”. As this result, it provide a basic “grid” structure system for the latter transcrustal magmatic events which happened in Qingshan stage (120-90Ma). The distribution of volcanic rocks is mainly along the faults system. In the field, the volcanic edifice and intrusion diapers into the former layers and the granite evolves some sedimentary rock when it touched the bottom of the basin, during the magma transcrustal ascending. The chronology of volcanic rocks shows the volcanism mainly happened in 120-100Ma. And the geochemical results shows (1) The volcanic rocks are mainly caused by the delamination, (2) the magma mainly originated from the lower crust, (3) The “oceanic sediments” participated into the magma evolution process.

In addition, the research on granite shows (1) the former granite (before 150Ma) is merely caused by the delamination, (2) the latter granite (145-130Ma) is also caused by delamination, but the mineralization in the some period shows there is participation of fluid of Paleo-Pacific plate, (3) the last period granite (120-100Ma) are associated to the rollback of subducting paleo-Pacific.

Above all, the role of paleo-Pacific plate becomes more and more important during the evolution of Sulu orogenic belt in early Cretaceous.