

The Sr-Nd Isotopic Characteristics of Volcanic Rocks from Xinlu Basin, Western Zhejiang Province, China and Its Tectonic Significance

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Abstract: The Xinlu Basin located in southern margin of the Yangtze block, the north side of the middle Jiangshan-Shaoxing deep-fault, is a volcanic faulted-basin developed in Yanshanian epoch. Based on studying Sr-Nd isotopic composition of Mesozoic acid volcanic rocks from the Xinlu Basin, Western Zhejiang Province, source rock properties and dynamics of regional tectonic evolution were discussed in this paper. Results indicate that I_{Sr} mean values of crystal debris tuff from the Huangjian Formation and of granite-porphyry are 0.714 10 and 0.710 39, with $\epsilon_{Nd}(t)$ mean value of -5.5 and -5.7, respectively. Two stage model ages (T_{2DM}) of crystal debris tuff from the Huangjian Formation and of granite-porphyry are 1 366 Ma and 1 387 Ma, respectively, close to the age (1 400 Ma) of Chencai group in the basement of Cathaysia Block, and have remarkable difference with the age (900–1 000 Ma) of Shuangxiwu group from the basement of Yangtze-block. The $\epsilon_{Nd}(t)$ values both from the Huangjian Formation volcanic tuff and granite-porphyry are located in Nd isotopic evolutionary domain of Chencai group. It is also found that Huangjian Formation crystal debris tuff and granite-porphyry have similar source rocks related with mixing material derived from crust and lithospheric mantle. The part of the crust source may be from Chencai group metamorphic rock of the Cathaysia Block and has no connection with Shuangxiwu group within Yangtze block. It is speculated that continent-continent-collision had occurred during the period of 900 Ma to 1 000 Ma or later with dynamic characteristics of subduction from the Cathaysia Block to the Yangtze Block in western Zhejiang Province.

Keywords: Sr-Nd isotope; volcanic rock; source material; The Xinlu basin