Introduction

The formation of the basic dyke is directly related to the lithospheric thinning and crustal extension, which can contain rich mantle source information and measure the important tectonic conversion time scale. The research on basic dyke has been an important disquisitive issue within the country and abroad these years, for its great significance in the study of deep mantle and evolution of continental dynamics (Cao Haojie et al., 2011; Liu Xue-min et al., 2010; Mao Jingwen et al., 2006; Qin Xiaofeng et al., 2008; Wang Yan-bin et al., 2004; Xu Yunfu et al., 2009).

The Sanqisan uranium deposits are located in the western part of the geologic region known as the Youjiang basin, the north end of Xidaming Mountain convex and the Northeast end of Naling-Fengtun anticline of Daxin concave broken bunch. This deposit is a typical carbonate-siliceous-pelitic rock type uranium deposit in South China. Controlled by tectonic fracture zone, the orebodies occur in the carbonate rock and clastic rock in Devonian. There are northwest-southeast diabase dykes located in the northeast and southwest of the Sanqisan uranium deposits. In the predecessors’ study of metallogenic regularity, the relation between the diabase dykes and the metallogeny has not been studied yet.

To study the relation between the diabase dykes in this area and the metallogeny of the Sanqisan uranium deposits, three samples are collected to study the geological, geochemical and the chronology of Diabase, and then the relation between the diabase dykes and the metallogeny are discussed.

Geological and Geochemical Characteristics

2.1 Diabase petrological characteristics

Sample Dx01, has been completely supracrustally weathering, Maroon and sandy, the original structure of diabase are both visible on the surface. Sample Dx02-4 is gray, block structure, and its alteration phenomenon is obvious, with pyritization, silicification and kaolinite. Sample Dx02-4 is sage green, block structure, and is basically unweathered.

Generally, Dolerite are controlled by the crack in north west, and suffering the later metamorphism and altered effect, the dolerite is made up of altered mineral such as kaolinite, serpentine, chlorite, and uranium mineralized in partial area.

2.2 Geochemical feature

The content of SiO₂ in rocks has a large variation, mainly caused by chloride. SiO₂ is obvious negatively correlated with Fe₂O₃, MgO, CaO and FeO. alkali degree (Na₂O + K₂O) is poor. Based on the big ratio of K₂O/Na₂O, the magma series for calcium alkaline series. Trace element enriches high field strength element Ta, Nb, Zr, Hf, and big ion lithophile element Rb, U, Th, Ba, and losses Sr. So tectonic environment is distinguished as the plate basalt (WPB). Rare earth elements the chondritic standardized distribution type is more consistent figure right mode, no obvious Eu abnormal, the total amount of rare earth elements is higher.

3 U-Pb Chronology of Zircon

U-Pb dating analyses were conducted by LA-MC-ICP-MS (Finnigan Neptune, Newwave UP 213 Laser Ablation System). The Cathodoluminescence (CL) images and the zircon U-Pb concordia diagram of analyzed grains are shown in Fig.1.

Sample Dx02-4, the crystallisation age of the diabase is given by the mean ⁸⁶⁹²⁰Pb/²³⁸U age (89.32±0.9Ma, MSWD=1.10) for the main group of 25 analyses of each sample (95% confidence interval). U-Pb age of sample Dx01 and Dx03 are 91.6±8.3Ma and 86.7±1.8Ma.
respectively. Thus, the diabase in the study area are 86.7±1.8~91.6±8.3Ma in late Yanshanian epoch.

4 Discussion

From the chronology characteristics, the U-Pb age of zircons in diabase rock is overall for 90 Ma or so, developed in late Cretaceous. The results show that the later multiple stage tectonics-hydrothermal activities or metamorphic ages are later than 90 Ma of the late Cretaceous in late Yanshanian epoch. The formation time of uranium mineralization in Daxin consists of two stages, respectively for 60 Ma and 120 Ma. Thus, there have important relationship between mineralization and with diabase in Daxin.

Combining the above analysis, the results indicate important significance of diabase dykes for the two stages of mineralization of Sanqisan deposit. The early stage mineralization (formed before 120 Ma) may be accompanied by crustal extension and intrusion of basic magma. The late-stage mineralization (formed in around 60 Ma) may be the enrichment of uranium material in the early Himalayan tectonic thermal event. The diabase dykes are the ore-forming material sources and provide the interface of the physical and chemical conditions.

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