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Geochemical Characteristics and Uranium Mineralization Potential of The Yanshanian Granite in The West of Yunnan Province

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1 Introduction

The Sanjiang metallogenic belt is one of the important nonferrous metal metallogenic belts in China, the potential resources of copper, lead, zinc, silver, gold and tin are huge (Zhengqian et al., 1993). In the west of Yunnan province has a lot of Yanshanian granite, according to 1:20 million test data, development of granite belt rich in radioactive minerals in the west of Yunnan province, there are also high-value zones and uranium mineralization points and anomalies measured by the gamma-ray spectrum of the car. In this paper, the petrographic study of the Yanshanian granite in the West of Yunnan province is carried out. The rock mass geology and geochemical characteristics of the related rock mass are compared with the corresponding characteristics of uranium granite in South China, and then discusses the uranium mineralization potential of Yanshanian granites in the west of Yunnan province.

2 Geochemical Characteristics of the Yanshanian Granite

The Yanshanian granites in the west of Yunnan province are more developed, and most of them are concentrated in the northern section of the Lincang granite belt (Jitan Chen, 1987). During the Jurassic period, mainly included the Shaojie granite, the Shale granite, the Ganhaizi granites and the Yangtoushanyan granite. The Yanshanian granites, mainly included the Luyintang granite and the Dajianshan granite. Granite type is Biotite monzonitic granite, Potassium feldspar albite granite and granodiorite (Le Maitre R W, 2002).

2.1 Constant Element Characteristics

The Yanshanian granite constant element

characteristics are described in detail below, $w(\text{SiO}_2)=59.15\sim76.81\%$ (average 71.04%), $w(\text{Al}_2\text{O}_3)=11.98\sim18.71\%$ (average 14.22%), $w(\text{K}_2\text{O})=0.56\sim6.01\%$ (average 3.70%), $w(\text{Na}_2\text{O})=2.21\sim8.94\%$ (average 3.52%), $w(\text{CaO})=0.21\sim6.20\%$ (average 1.74%), $w(\text{TiO}_2)=0.06\sim0.81\%$ (average 0.30%), $w(\text{K}_2\text{O}+\text{Na}_2\text{O})=5.20\sim9.78\%$ (average 7.22%), $w(\text{K}_2\text{O}/\text{Na}_2\text{O})=0.08\sim2.26$ (average 1.19).

2.2 Trace element characteristics

Trace element mass fraction respectively described as follows, $w(\text{U})=0.69\sim16.01\times10^{-6}$ (average 5.67×10^{-6}), $w(\text{Th}/\text{U})=1.49\sim13.62$ (average 5.98), $w(\text{Rb})=22\sim390\times10^{-6}$ (average 174×10^{-6}), $w(\text{Sr})=11.65\sim594\times10^{-6}$ (average 166×10^{-6}), $w(\text{Rb}/\text{Sr})=0.11\sim10.83$ (average 2.47), $w(\text{Nb})=5.3\sim44.3\times10^{-6}$ (average 16.89×10^{-6}), $w(\text{Ta})=0.28\sim4.52\times10^{-6}$ (average 2.04×10^{-6}), $w(\text{Nb}/\text{Ta})=4.17\sim27.14$ (average 10.72). The values are significantly lower than the eastern China upper crust average (16.2), indicating that the source area of the rock mass is crustal material. In the trace element distribution spider web map can be seen, trace elements were right-leaning. Compared with the original mantle, the rock mass loss of Zr, Ti, enrichment Rb, Th.

2.3 Rare earth element characteristics

The total amount of rare earth in granite is $40.70\sim417.30\times10^{-6}$ (average 183.75×10^{-6}), $w(\text{LREE}/\text{HREE})=3.86\sim16.23$ (average 9.38), $(\text{La}/\text{Yb})_N=2.79\sim28.54$ (average 11.83). The distribution curve of Rare earth elements was slightly right near the straight line of the "seagull type", and the continental shell remelting granite linear. The negative anomalies of Eu loss, and the separation of plagioclase in the process of crystallization of magma fractionation.

3 Analysis of uranium mineralization potential of granite.

The uranium granite in southern China has the

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characteristics of rich Si, lean Ti, Fe, Ca, Mg, high alkali and aluminum supersaturation. Uranium granite is lower than that of non-uranium granite, and the content of Cr, Ni and Co is low and the total amount of rare earth is low.

A/ACK (of the Yanshanian granite in the west of Yunnan) > 1, it indicates that it is aluminized granite, which is consistent with the corresponding characteristics of uranium granite in South China, and both of them are aluminous granites. The Yanshanian granite in Yunnan section shows a high total amount of rare earth and a wide range of variation, which is higher than the average value of uranium granite in southern China, and the depletion rate of europium is stronger than that in Southern China uranium granite. Uranium granite geochemical characteristics roughly consistent. In summary, the Yanshanian granites in the Yunnan section have certain uranium mineralization potential.

The different characteristics of uranium granites in the Yanshanian granites of the Yunnan section in some aspects may be related to their complex tectonic

backgrounds. On the other hand, the uranium mineralization work in this area is low, Period granite in order to make new progress in granite prospecting in Sanjiang area.

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