

# He and Ar isotopic composition in pyrite and its significance in No.338 deposit, Xiazhuang uranium ore-field, South China

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Xiazhuang uranium ore-field was one of the most important granite-type uranium deposits in China. Former study of 20 century shown that meteoric water original ore-forming fluid and crust-derived uranium involved in the uranium mineralization[1]. While the latest study of 21 century indicated that mantle-derived CO<sub>2</sub> and mantle fluid derived from the diabase been involved in the uranium mineralization[2]. Isotopic composition of He and Ar in pyrite, one of the most important paragenetic minerals with pitchblende in No.338 uranium deposit been applied to reveal the original of the ore-forming fluid in this paper.

Pyrite paragenetic with pitchblende was sampling from the mine galley of No.338 uranium deposit. He and Ar isotope was analyzed by the MI-1201IG inert gases mass spectrograph in the isotopic laboratory of Institute of Mineral Resources Chinese Academy of Geological Sciences. Calculated results discussed below:

<sup>3</sup>He/<sup>4</sup>He value varied in 0.79~0.06Ra, higher than 0.01~0.05Ra, the crust <sup>3</sup>He/<sup>4</sup>He value, but lower than 6~7Ra, the continental mantle <sup>3</sup>He/<sup>4</sup>He value[3]. All samples distributed between the crust original and the mantle original range in <sup>3</sup>He/<sup>4</sup>He diagram (omitted), which suggests that the No.338 uranium deposit had the crust and mantled mixed original of the ore-forming fluid. <sup>40</sup>Ar/<sup>36</sup>Ar value varied between 282~319, all samples distributed between the crust original and the mantle original range in Rc/Ra vs. <sup>40</sup>Ar/<sup>4</sup>He diagram (omitted), which also suggest the characteristic of mixed Ar original. The isotopic composition of He and Ar in pyrite might suggest that ore-forming fluid of No.338 uranium deposit might be the mixed product of crust and mantle fluid.

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## References

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