

The experimental study on the uranium migration process of sandstone-type uranium mineralization

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A test device on long-distance uranium migration for the simulation of the uranium migration process in sandstone uranium deposits has been designed [1].

The organic tube with 35mm internal diameter and 300cm long was used in the test device. The test device artificially tilted angle is 13.7° due to ore deposits angle is about 10°. The water-head is about 3m and the flow rate is 100ml/d in the device.

The sample mouths were set at 40, 60, 130, 200, 250cm respectively. The researchers have studied the hydrodynamic conditions of uranium and the changes of the hydrology chemical parameters (Eh, Ph, U, Fe, etc.) through analyzed the samples chemical composition respectively, furthermore, concluded the regularities of uranium mineralization.

The experimental water samples come from a slope plot springs near the 377 orebody in Yili Basin, Xinjiang. The total water samples is 5000ml, which uranium content reached 0.276mg/l.

Then the test device was filled into sand-sample with purified water immersion, so as to determine the initial Eh value and the dispersion parameter.

The experimental study on uranium migration with the water samples has been on. The results shows that uranium was precipitated when the uranium content in water samples down to 0.002mg /l.

All the uranium at the 30cm point was restored after 9h, and at the 60cm was restored but at 130cm is not restored after 11h.. The result is 0.58m when the data was bring into the model-generation, however, there are some errors compared to the test results. The main reason is that the parameters of flow control is few, boundary and initial conditions is simplistic.

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[1] Li W.J. *et al.* (2009) *Goldschmidt Conference Abstracts* 46.

A LA-ICP-MS chronological and tectonic environment study of the ore-bearing volcanics in Baiyin orefield

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The Northern Qilian orogenic zone is one of the most important massive sulfide deposit provinces in China and the world, especially, the Baiyin mine field which located at its east is a representative massive sulfide deposit. After the porphyroclastic lava extruding and the quartz albitophyre intruding which belong to the later acidic volcanic, The Baiyin mine field began mineralization, and ends at a relatively quiet period before a large-scale basic volcanism. Therefore, there is an important meaning to research the age and tectonic environment about the acid volcanic and the basic volcanic. In this paper, by using LA-ICP-MS zircon U-Pb isotope dating techniques we were determine the age of the basic volcanic in Baiyin orefield, the formation time of the basic volcanic in Baiyin orefield is 465.0 ± 3.7 Ma, this age should be belonging to Middle Ordovician ; Researched by predecessors and with the same method, the age of acid volcanic in Baiyin orefield is 467.3 ± 2.9 Ma, So we think the age of the rocks and the mineralization of the Baiyin orefield should be appertaining the later Middle Ordovician. All the discovered industrial deposits were produced in marine bimodal volcanic rocks, the marine bimodal volcanic rocks are composition of quartz keratophyre, spilite and a small amount of keratophyre, Chondrite-normalized trace element distribution patterns display that there is a negative anomalies for the Nb, Ta and Ti, combined with tectonic evolution of the North Qilian Mountains, and the ore-bearing volcanic rocks of the Baiyin mine should be formed in the island arc--rift environment in the later Middle Ordovician. The results of the study has a very important significance for tectono-magmatic evolution of the Qilian orogenic belt and also for the guiding the regional geological prospecting.

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