

## **Baiyun'ebo Iron, Rare Element and Rare Earth Element Telescoped Metallogenic System\***

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Baiyun'Ebo is a unique telescoped deposit, which consists of a large iron deposit, a large rare element deposit, and a super-large rare earth element deposit. Its REE reserves account for 70% that of the whole world.

The mineralized country rocks are carbonate, K-rich siliceous rock, aegirine-biotite schist and basic volcanic rock of middle Proterozoic. The ore bodies, being bedded or stratified, emerge in the contact zone between carbonatite and K-rich siliceous rock and in basic volcanic rocks. Rare elements and rare earth elements can form independent ore bodies besides coexisting with magnetite.

The main coexisting minerals contain magnetite, hematite, columbite, rare-earth carbonatite, fluoride, sulfate, carbonatite and silicate.

There are three groups in correlation analysis: REE-F-Ba-Fe<sub>2</sub>O<sub>3</sub>-TiO<sub>2</sub>, Nb<sub>2</sub>O<sub>5</sub>-CaO-P<sub>2</sub>O<sub>5</sub>-MgO-FeO-MnO, Al<sub>2</sub>O<sub>3</sub>-SiO<sub>2</sub>-K<sub>2</sub>O-Na<sub>2</sub>O. The first two groups are positive correlation, but they are negatively related to the last group.

Mineral paragenetic relationship, mineralization character and element correlation analysis indicate that the deposit underwent five metallogenic periods: alkali magmatic eruption and hot-water spout in middle Proterozoic. Basic volcanic rock, K-rich siliceous rock, silicate, fluorite-quartz magnetite and dolomite were formed. At the same time, columbite was formed and REE was enriched initially, Regional metamorphism in late Proterozoic. The tectonic movement made the orebed folded, the textures and structures of rocks transformed, and the mineral composition adjusted and enriched partly, Metasomatism of intrusive magmatic hydrothermal solution in late Proterozoic. Magmatic hydrothermal solution caused mobilization, assimilation and migration of F, Fe, REE and Nb. Then it mineralized through metasomatic-enrichment process. It is the main mineralization period of hematite and REE, •Modification by geothermal action in Meso-Cenozoic era. Mineralization of vein type was formed locally, •The present ore bodies are only 1/2~1/3 of the initial caused by intensive weathering and denuding due to the crust uplift.

\*The project is supported by National Science Fund of China.