Beizhan iron deposit is the most representative deposit in Awulale iron ore belt of western Tianshan. This iron ore belt is one of the significant areas on prospecting breakthrough in recent years. At present the proved reserves in this area are 1.49 billion tons, and the prospective resources are more than 2.5 billion tons. It is an important exploration and development base of iron ores in Xinjiang and even in the whole country. Many geological workers have done lots of exploration and scientific research in this place, but there are still theoretical controversies regarding the genesis of Beizhan iron deposit. Take Beizhan iron deposit as an example, this essay proceed from geological characteristics of the deposit and the basic shapes of orebodies, combined with mineralogy, mineralography, geochemistry of ore deposit and other disciplines to discuss the mineralization parental magma and the source bed of Beizhan iron deposit.

1 Geological Characteristics of Deposit

Ore-bearing rocks of Beizhan iron deposit are altered basalt and basaltic tuff of the upper part Dahalajunshan mountain group. Orebodies appear to bedded and stratoid shapes (Fig 1). Through the observation of rock core on the drilling named ZK809 and the identification of light flakes, we find that the ore-bearing rocks of iron deposit are the basalt of Dahalajunshan mountain group (Fig 1). The main altered minerals are including epidote, chlorite, actinolite, diopside, garnet, carbonate minerals, etc. And there is a small quantity of epidotization and chloritization basalt in the local ore bodies. Besides, the gradient series of basalt/weak mineralized basalt/mineralized basalt/magnetite ore show a gradient transition phenomenon, this demonstrates that the iron ore bodies have a close symbiosis with basalt (they have a gradient transition relationship). (Magnetized) basalt does not have obvious metasomatism relationship with the top carbonation tuff or marble. A small amount of diopside and garnet were formed before the mineralization of main magnetite. A large amount of garnet, epidote, actinolite and other minerals were formed in the hydrothermal stage which is after the mineralization of main agnetite.

2 Geochemical Characteristics of Deposit

The characteristics of rare earth elements between iron ores and silicate rocks show that the ∑REE value of iron ores is a little less than the ∑REE value of its wall rocks generally. The degree of fractionation between LREE and HREE of iron ores is similar to intermediate-basic lava, as well as its internal LREE and internal HREE. The distribution curve characteristics of normalized REE chondrite: The distribution patterns of iron ores are similar to intermediate-basic lava—all belongs to rightward inclined LREE enrichment type, especially the distribution patterns between iron ores and basalt.

The characters of the trace elements between iron ores and silicate rocks show that the distribution patterns of iron ores are similar to silicate rocks in general. Especially the iron ores show the characteristic loss of Nb and Ta, it has the same characteristic of trace elements with basaltic wall rocks.

In conclusion, study on geological characteristics, petrology and mineralography of Beizhan deposit indicates that the iron ore bodies have a close symbiosis with basalt (they have a gradient transition relationship), other types of rocks in this deposit do not have this characteristic. Not only in REE characteristics and REE distribution curve, but also in trace elements and...
their distribution curve between the iron ores and intermediate-basic lava, both show good similarity. Pb isotopes of them also have a good correlation. Based on the above characteristics, we hold the opinion that the genesis of this deposit is belongs to magmatic-hydrothermal stacking compound type and the parental magma belongs to basaltic magma.

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