Xinzhuang gold deposit is located in the northern part of the North China Craton intermediate belt, and in a Mesozoic tectonic-magma activation area which is embedded by the two tectonic units-the northwestern Wutai uplifts of Shanxi platform and the southwestern Yanshanian subsidence belt. The stratum of this Mining area is mainly old archean metamorphic rock series, proterozoic carbonate rocks and Mesozoic volcanic rock formation. The NW and NNW trending faults are the main structure of this Mining area. The NW trending fractures are the main Ore-hosting Structures, this group of faults in the mining area is concealed in southern part. The scale of NNW trending faults’ outcrop is larger, their tendency is north east and their dip angle is relatively steep. Gold bearing sulfide quartz vein and signs of hydrothermal activity can be seen in this fault zone. Magmatic rocks are mainly the product of the activities in yanshan period, its lithology is mainly for quartz diorite and other vein rocks which are porphyry, diorite porphyrite, metamorphic fai green (Bin), etc.

Combined with the field geological surveying, the microscopic mineral paragenetic association characteristics and the previous studies, the mineralization of this area is divided into three stages: (1) stage of quartz-pyrite, concretely embodied in gold containing pyrite-quartz veins; (2) quartz - polymetallic sulfide phase, concretely embodied in gold containing polymetallic sulfide quartz vein; (3) stage of carbonate, concretely embodied in the gold containing calcite quartz vein of iron ore.

2 Mineral Deposit Genesis

Xin zhuang gold deposit has the following basic characteristics in terms of deposit characteristics and ore-forming process:

(1) Ore body is mainly in the form of gold containing sulfide quartz vein and strictly controled by NNW trending secondary fracture. And there are obvious boundaries between it and its surrounding rock.

(2) The major metallogenic stages (quartz, pyrite, quartz - sulfide phase), the formation of the main mineral composition (quartz-pyrite; quartz-polymetallic sulfide), and typical ore texture and structure (granular texture, hypidiomorphic and xenomorphic granular textures, fissure filling textures, poikilitic texture, metasomatic dissolution texture, vein cross texture and solid separation texture; massive, belt, net vein and comb structure) fully show the characteristics of hydrothermal mineralization.

(3) The main types of the wall-rock alteration which is the result of hydrothermal activity are potash-alteration (hematitization) – silicification, stagespyritesericitization – kaolinite – chloritization and carbonatization. As well as it shows the evolution rule that as the evolution of Magmatic hydrothermal ore-forming fluid, the temperatures tends from high to low.

(4) The texture and structure of the ore is mainly filling texture, poikilitic texture and vein texture as well as streaked structure and vein structure. Ore bodies are mainly quartz vein type filling the fractures and a small amount of structural altered rock type which is formed by hydrothermal fluid. It indicates that magmatic
hydrothermal activity and mineralization in this area has connection in genesis.

(5) The initial Ore-forming fluid is characterized by high temperature (320 °C ~ 320 °C) and secondary salinity (4.2~11.6%). And as reaching the main stage of mineralization, it turns to medium temperature (220 °C ~ 260 °C) and secondary salinity (4.5~17.6%). Ore-forming pressure range is 45.7 ~ 45.7 MPa, as well as the metallogenic depth is between 1.52 ~ 3.27 km. All that shows that it belongs to the typical medium temperature epithermal deposit.

(6) The sulfur isotope of pyrite in this Mining area (δ34S values 1.13-2.45‰CDT) is close to that of meteorite, and is mainly derived from magmatic hydrothermal. The hydrogen and oxygen isotope characteristics of quartz vein and the characteristics of fluid inclusions shows that composition of hydrogen and oxygen isotopic has the characteristics of mixture of atmospheric precipitation and the deep magmatic, ore-forming fluid is mainly magmatic water with less meteoric water joining in the later ore_forming stage.

3 Conclusions

In summary, the formation of Xin zhuang gold deposit and yanshan period magmatic emplacement has a close genetic relation on cause. Magmatic activity brought the formation of ore bodies this area with a lot of ore-forming materials. Fracture at all levels provided favourable space for locating of the ore body, and it has the obvious characteristics of filling. The Genesis of the deposit is belong to quartz vein type gold deposit which is related to Yanshanian magmatic activity.

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References


