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摘要:

桦树沟铜矿床是近20年来在北祁连山西段镜铁山矿田铁矿体之下发现的一种新类型铜矿床, 其成矿构造环境与形成时代存在较大争议。本文通过对与铜矿床密切共生的闪长玢岩脉的主量元素、微量元素、稀土元素以及Sr、Nd、Pb同位素分析, 发现闪长玢岩具有明显的板块俯冲岩浆作用特征, 大离子不相容元素Rb、Ba、Th、U、K、Pb富集, 高场强元素Nb、Ta、Ti亏损, 轻重稀土分馏明显, 岩石富含放射成因铅, $n(206\text{Pb})/n(204\text{Pb})$ 、 $n(207\text{Pb})/n(204\text{Pb})$ 、 $n(208\text{Pb})/n(204\text{Pb})$ 比值分别为17.72~18.96、15.497~15.566、37.218~38.674; $n(87\text{Sr})/n(86\text{Sr})$ 比值在0.7053~0.7084之间; $n(143\text{Nd})/n(144\text{Nd})$ 值为0.5121~0.5122, 显示出EM II特征。锆石的U Pb LA ICP MS定年结果显示闪长玢岩形成于早古生代早—中奥陶世加里东期。成岩时代为 $421 \pm 24\text{Ma}$, 与铜矿床的成矿年龄一致, 且成岩过程中捕获了中元古代1536±370Ma古老地层基底的锆石。

关键词: [中酸性岩脉](#) [地球化学特征](#) [LA ICP MS定年](#) [铜矿床](#) [桦树沟](#) [镜铁山](#) [祁连山](#)

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Abstract:

The Huashugou copper deposit is a new type copper deposit discovered under the iron orebodies in the Jingtieshan orefield, western section, North Qilian Mountains, in last 20 years. It is in argument about the tectonic environment and the formation time of the copper deposit. This paper systemically analyzes on main elements, trace elements, rare earth elements and Sr, Nd, Pb isotopes of the diorite porphyrite in the Huashugou deposit, and indicates that the rocks have obvious characteristics of magmas associated with plate subduction. The diorite porphyrite are enriched in Rb, Ba, Th, U, K, Pb, while depleted in Nb, Ta, Ti, and obviously enriched in LREE to HREE. The rocks are enriched in radiated lead, and the value of $n(206\text{Pb})/n(204\text{Pb})$, $n(207\text{Pb})/n(204\text{Pb})$, $n(208\text{Pb})/n(204\text{Pb})$ are 17.72~18.96, 15.497~15.566 and 37.218~38.674 respectively. The number of $n(87\text{Sr})/n(86\text{Sr})$, $n(143\text{Nd})/n(144\text{Nd})$ is 0.7053~0.7084, 0.5121~0.5122, reflecting characteristic of EM II. The zircon U Pb LA ICP MS dating shows that the age of the diorite porphyrite is about $421 \pm 24\text{Ma}$, i.e., the diorite porphyrite should be formed in Ordovician, the Caledonian time. It is consistent to the formation time of the copper deposit. At the same time, the magmas that produced the diorite porphyrite captured older zircon of Mesoproterozoic Era, whose age is about $1536 \pm 370\text{Ma}$.

Keywords: [medium—acid dyke](#) [geochemical feature](#) [LA ICP MS dating](#) [copper deposit](#) [Huashugou](#) [Jingtieshan](#) [Qilian Mountains](#)

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