

东天山红云滩铁矿稳定同位素地质特征及其对成矿作用过程的指示

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中文摘要:东天山觉罗塔格红云滩铁矿大多被认为是海相火山岩型铁矿,该类矿床的成矿机理通常被描述为早期形成的矿源层被后期热液交代改造富集。本文通过对红云滩铁矿稳定同位素特征的研究发现,该矿床其实为特定火山岩层经过前期广泛碱交代,然后叠加矽卡岩化而形成的热液交代矿床。成矿过程先后分为五个阶段:火山岩矿源层形成、碱交代、矽卡岩蚀变、磁铁矿生成和石英-硫化物沉淀。在红云滩铁矿成矿过程中,成矿流体是不断的演化的:在最初红云滩岩体石英形成阶段,可能就有少量大气降水的参与使其石英的氢同位素亏损 $2H$;在大量矿石矿物磁铁矿形成阶段,可能有较多大气降水的流体加入使磁铁矿亏损 $18O$;在成矿后期大量石英和硫化物形成阶段,有大量大气降水加入,此时成矿流体则不但继承了先前岩浆热液低 δD 值的特征,也继承了磁铁矿形成期流体 $\delta 18O$ 值稍低的特征,不同于岩浆水也区别于变质水。

中文关键词:稳定同位素特征 成矿作用过程 红云滩铁矿

Study on Stable Isotopic Characteristics of the Hongyuntan Iron Deposit of Eastern Tianshan and Their Implications for the Process of Mineralization

Abstract:The Hongyuntan iron deposit in Qoltag area of Eastern Tianshan in Xinjiang has long been believed to be a marine volcanic type deposit. The metallogenic mechanism of this type deposit has been regarded as the enrichment of the early formed ore source bed by the later hydrothermal metasomatism. According to the study of stable isotopic characteristics of this deposit, a new opinion is proposed in this paper: Hongyuntan is a pyrometasomatic deposit, which was formed by the superimposition of the later focal skarnization of special volcanic rock sequence upon early extensive alkali metasomatism. The process of the mineralization can be divided into five stages: the formation of special volcanic rock sequence, alkali metasomatism, skarnization, production of magnetite and deposition of quartz and sulfide. During the process of the mineralization, the ore-forming fluid evolved continuously: at the stage of the formation of the quartz in Hongyuntan magmatic rock, the mixture with low δD value fluid caused the depletion of $2H$ in the fluid which produced the quartz; in the course of the massive production of magnetite, the addition of low $18O$ fluid resulted in the depletion of $18O$ in the magnetite; during the deposition of massive quartz and sulfide, the ore-forming fluid inherited not only low δD but also low $\delta 18O$ features, and thus the fluid differed from both magmatic fluid and metamorphic fluid.


keywords:[stable isotopic characteristics](#) [process of mineralization](#) [Hongyuntan iron deposit](#)

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