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西昆仑阿巴列克铜铅矿床黄铜矿Re-Os定年及地质意义

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摘要:

除了传统的测试Rb-Sr、Sm-Nd、U-Th-Pb、K-Ar或Ar-Ar等方法来讨论碳酸盐岩层控型铅锌矿的成矿年龄外,利用硫化物矿物Re-Os析成矿过程,在矿床成矿系统上也是十分重要而有效的工具。从新疆西昆仑阿巴列克铜铅矿床的主矿体中,选取7个黄铜矿和1件黄铁矿样品,其进行了Re-Os定年。结果表明它们分别含有 $626 \times 10^{-9} \sim 14533 \times 10^{-9}$ Re和 $0.026 \times 10^{-9} \sim 0.36 \times 10^{-9}$ Os,给出海西期的 331.3 ± 5.2 Ma等时线年龄。样品的高Re/Os比值、低含量普通Os和高放射成因Os的组成特性支持这组黄铜矿样品为表壳构造成因。构造演化历史表明,塔里木地块西南缘在晚古生代属于被动大陆边缘,赋矿地层霍什拉甫组属于台地相碳酸盐岩-碎屑岩建造,地层时代与上述等时年龄几乎近。本次工作提供了一个新的证据,支持阿巴列克矿床在海西期经历了同生成矿作用,矿床类型主要为沉积层控型,成矿物质主要来源于地层化发生在上泥盆统与下石炭统的结合部位,岩性以砂岩与碳酸盐岩组合为主,具有特定的层位控制特点。从中可以看出,碳酸盐岩层控型铅锌矿床成因具有一定的复杂性,具有深入研究的广阔空间。

英文摘要:

It is a very important and effective method of analyzing the ore-forming processes by taking advantage of geochemistry analytical approaches as well as traditional ways, such as testing the Re-Os, discriminating the paragenetic association of the minerals and the tectonic settings. Seven chalcopyrite and one pyrite samples from the main orebody of Abaliekue Cu-Pb deposit are used for Re-Os dating. The chalcopyrite is associated with galenite and dolomite which contain $626 \times 10^{-9} \sim 14533 \times 10^{-9}$ of Re and $0.026 \times 10^{-9} \sim 0.36 \times 10^{-9}$ of Os respectively, and yield a Hercynian isochron age of 331.3 ± 5.2 Ma. High Re/Os ratio, low Os concentration and highly radiogenic Os isotopic ratios of these samples suggest that they are of crustal origin. The tectonic evolution shows that the southwestern margin of the Tarim block was a passive continental margin in the Late Paleozoic era. Because of the Paleo-Tethys ocean movement during Carboniferous, the depression basin are formed in margin of Tarim craton, comprised lead-zinc deposits in clastic rock-carbonate host stratum that cover up the Devonian. This Re-Os isotopic dating age of chalcopyrite is nearly closed with re-hosted stratum. Our Re-Os result provides new evidences, showing that Abaliekue Cu-Pb deposit experienced the syngenetic ore-forming process in Hercynian. Also this study gives important geochemical evidence on such issues: the lead-zinc deposits are mainly sedimentary formation-controlled type; the ore-forming elements mainly came from stratum; mineralization occurred in the joint position between Upper Devonian and Lower Carboniferous, while the rock which mainly consist of sandstone and carbonate formation. It can be seen that the metallogenic system of the copper-lead-zinc strata-bound deposits in carbonate rock has a certain complexity and provides wider space for further searches.

关键词: [黄铜矿](#) [Re-Os同位素](#) [铜铅矿床](#) [西昆仑](#)

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