

丁正江,孙丰月,刘建辉,刘殿浩,李碧乐,张丕建,钱烨,李杰. 2012. 胶东邢家山钼钨矿床辉钼矿Re-Os同位素测年及其地质意义. 岩石学报, 2(9): 2721-2732

胶东邢家山钼钨矿床辉钼矿Re-Os同位素测年及其地质意义

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基金项目: 本文受山东省财政项目(鲁勘字[2007]56号、鲁勘字[2009]066号); 中国地质调查局综合研究项目(200310200012)联合资助, 并受“985”创新平台——东北地区资源与环境创新平台支持

摘要:

邢家山矿床是胶东地区一特大型矽卡岩-斑岩型钼钨矿床, 构造位置上处于华北板块东南缘与扬子板块对接地带, 在成因上与幸福山似斑状含角闪二长花岗岩密切相关, 归属于该区与燕山早期花岗质岩浆作用有关的特大型、大型和中型铜钼多金属矿床成矿系列。本文对该矿床透闪石石榴卡岩中的辉钼矿进行了Re-Os同位素测年, 结果显示, 辉钼矿Re-Os同位素模式年龄范围为 $156.91 \pm 1.78\text{Ma}$ 至 $160.70 \pm 1.66\text{Ma}$, 加权平均值为 $158.91 \pm 1.91\text{Ma}$, 对应的Re-Os等时线年龄为 $158.70 \pm 2.06\text{Ma}$; 这些年龄数据与区域上的燕山早期花岗岩锆石U-Pb年龄($158.53 \pm 0.79\text{Ma}$)相近, 指示区域上该期铜钼多金属矿化与区内花岗岩具有密切的时间和成因关系。中、晚侏罗世华北东部广泛的地壳增厚作用和地壳重熔导致的大规模地壳重熔型花岗质岩浆活动为该区钼钨多金属矿成矿提供了主要成矿物质和流体。结合已有的研究成果, 认为胶东中生代以来岩浆活动及相应的成矿作用可能主要存在4期, 即: 约165~155Ma的铜钼多金属矿化期、约137~110Ma的金矿化期、约120~110Ma的铜钼铅锌多金属矿化期、和约100~75Ma的金银铅锌多金属矿化期, 分别对应于燕山早期-燕山晚期的各期次花岗质岩浆活动。

英文摘要:

The Xingjiashan molybdenum-tungsten deposit, located in the intersection between North China block and Yangtze block, is a large-scale skarn-type deposit in the North Fushan ore field. It belongs to the regional multi-metal metallogenetic series related to the Early Yanshanian granitoid magmatic actions. In this study, in order to restrict the timing of mineralization, direct Re-Os isotopic dating on molybdenites collected from the skarn ore in the Xingjiashan molybdenum-tungsten deposit have been carried out. The results of Re-Os isotopic dating show that the Re-Os model age range from $156.91 \pm 1.78\text{Ma}$ to $160.70 \pm 1.66\text{Ma}$, with an average of $158.91 \pm 1.91\text{Ma}$, and give an isochron age of $158.70 \pm 2.06\text{Ma}$. Combined with the zircon SHRIMP U-Pb age of $158.53 \pm 0.79\text{Ma}$ of the Early Yanshanian granite, it is suggested that the mineralization of the regional molybdenum-tungsten is temporally and genetically related to the granite in the area, and the large-scale re-melting granitoid magma might provided the major metallogenetic materials and hydrotherm. Based on the results of Re-Os isotopic dating presented in this study and available isotopic data published in previous studies, we suggest that the mineralization in the Jiaodong Peninsula since Mesozoic could be divided into four mainly phases: the first is the copper-molybdenum multi-metal mineralization phase at ca. 165~155Ma; the second is the gold mineralization phase at ca. 137~110Ma; the third is the copper-molybdenum-lead-zinc multiple metal mineralization phase at ca. 120~110Ma; and the fourth is the gold-silver-lead-zinc multi-metal mineralization phase at ca. 100~75Ma. They are respectively responding to the multiphase granitoid magmatic actions during Early-Late Yanshanian.

关键词: [Re-Os同位素](#) [辉钼矿](#) [钼钨矿床](#) [邢家山](#) [胶东地区](#)

投稿时间: 2012-02-15 最后修改时间: 2012-06-15