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摘要:

本文对小西南岔富金铜矿床矿区内与成矿空间密切的成矿前辉绿 辉长岩、成矿期闪长玢岩岩脉进行了单颗粒锆石SHRIMP、LA ICP MS U Pb年龄的测定。实验数据表明: 辉绿 辉长岩的16个锆石或单点有 $387.0 \pm 11.8\text{Ma}$ 、 $292.0\text{-}251.1\text{Ma}$ (加权平均值 $270 \pm 14\text{Ma}$, $n = 10$)、 $129.8 \pm 2.6\text{Ma}$ 、 $107.0\text{-}95.4\text{Ma}$ (加权平均年龄为 $103 \pm 13\text{Ma}$, $n = 3$)和 $46.8 \pm 2.6\text{Ma}$ 五组谱和年龄; 闪长玢岩的11个锆石、12个单点仅获一组谱和年龄, 变化在 $108\text{-}98\text{Ma}$ 之间(加权平均值 $102.1 \pm 2.2\text{Ma}$)。结合CL图像特征, 初步厘定成矿前辉绿 辉长岩形成于早二叠世晚期($270 \pm 14\text{Ma}$, $n = 10$; $273 \pm 14\text{Ma}$, $n = 6$), 岩浆上侵过程中捕获了少量的泥盆世碎屑锆石, 在成岩后的早白垩世、新生代始新世中期曾被热液改造; 而闪长玢岩则形成于早白垩世晚期。考虑到伴生闪长玢岩的年龄与辉绿 辉长岩的 $107.0\text{-}95.4\text{Ma}$ 相匹配, 且辉绿 辉长岩的热液锆石年龄在 $103\text{-}95.4\text{Ma}$ 之间, 进而限定该富金铜矿床的成矿热事件应发生在 $108\text{-}98\text{Ma}$, 成矿作用发生在晚中生代地壳强烈伸展、减薄作用末期, 经晚白垩世—古近世的后期抬升被剥露于现今地表, 其成矿滞后于中国东北部晚中生代岩浆热液金矿床大规模成矿峰期(120Ma)约 10Ma 。

关键词: [暗色脉岩](#) [锆石](#) [CL图像](#) [单颗粒锆石U Pb年龄](#) [小西南岔金铜矿床](#) [延边](#)

Zircon Chronology of Melanocratic Dykes in the District of the Xiaoxinancha Au Rich Cu Deposit in Yanbian and Its Geological Implication [Download Fulltext](#)

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Abstract:

Zircon SHRIMP and LA ICP MS U Pb dating was performed on diabase gabbro of premineralization stage and dioritic porphyrite dykes of mineralization stage, collected from the Xiaoxinancha Au and Cu rich deposit, both of which have closely relation in spatial distribution. The results show that five sets of concordant ages for 16 zircon grains or spots from diabase gabbro are obtained, i. e. $387.0 \pm 11.8\text{Ma}$, $292.0\text{-}251.1\text{Ma}$ (Mean= $270 \pm 14\text{Ma}$, $n=10$), $129.8 \pm 2.6\text{Ma}$, $107.0\text{-}95.6\text{Ma}$ (Mean= $103 \pm 13\text{Ma}$, $n=3$) and $46.8 \pm 2.6\text{Ma}$; whereas one set of concordant ages ranging from $108\text{-}98\text{Ma}$ (Mean= $102.1 \pm 2.2\text{Ma}$), for 11 zircon grains and 12 spots from diorite porphyrite are obtained. Combined with the features of CL images, it was suggested that the premineralization diabase gabbro was formed in the late Early Permian epoch and trapped some detrital zircons during magma ascending (intruding) and subsequently experienced thermal modifications in the early Cretaceous and middle Eocene time. Diorite porphyrite was formed in the late Early Cretaceous. Considering the match of the age of diorite porphyrite with age $107.0\text{-}95.4\text{Ma}$ of the diabase gabbro, the ages of hydrothermal zircons from the diabase gabbro range between $103\text{-}95.4\text{Ma}$, which further indicates that thermal event of the gold copper mineralization took place in $108\text{-}98\text{Ma}$ and the mineralization occurred during the late stage of middle/late Mesozoic when the crust experienced intensive extension and thinning. Then, the gold and copper rich deposit was exposed to the present surface due to uplifting and denudation processes during the late Cretaceous Paleocene period. In general, the mineralization was 10Ma behind the large scale magmatic hydrothermal gold mineralization (120Ma) in East China during the late Mesozoic.

Keywords: [Melanocratic dykes](#) [zircons](#) [CL images](#) [single grain zircon U Pb ages](#) [Xiaoxinancha Au rich Cu deposit](#) [Yanbian](#)

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