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哀牢山南段长安金矿床成矿流体特征及成因类型探讨

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## 摘要:

长安金矿床是三江造山带哀牢山成矿带南段大型矿床之一,就位于甘河断裂的脆性破碎带内。其成矿流体具有中低温、中低盐度的特点,气相成分以 $H_2O$ 、 $CO_2$ 为主,主成矿期流体中 $CO_2$ 含量可达21.162mol%~32.832mol%;液相成分以 $Cl^-$ 、 $K^+$ 、 $Na^+$ 为主。成矿流体的 $\delta^{13}C_{CO_2}$ 值为-3.427‰~8.749‰,显示海相碳酸盐源特征并与岩浆活动有关; $\delta D$ 值为-111‰~-78.383‰, $\delta^{18}O$ 值介于10.527‰~13.565‰, $\delta^{34}S$ 值集中分布在+1‰~+3‰之间。综合表明长安金矿流体具有岩浆热液性质,同时,源自海相碳酸盐地层的变质水也参与了成矿作用。在哀牢山南段的金平地区,受新生代大规模富碱性岩浆沿断裂上侵的影响,含金的岩浆气液在运动过程中混合浅部流体并活化、萃取矿区地层及有关地质体中的金元素,使其转入溶液形成含金的成矿流体;当成矿流体运移到浅部有利构造或岩性部位时,物理化学条件的变化,促使Au等成矿物质快速沉淀、富集形成微细浸染状矿化。综合研究认为,长安金矿床兼具造山型和卡林型金矿床的典型地质地球化学特征,可被厘定为类卡林型金矿床,为卡林型与造山型之间的过渡类型。

## 英文摘要:

The Chang'an is one of the largest gold deposits in the southern Ailaoshan metallogenic belt in Sanjiang region, and the occurrence of ore bodies is controlled by the brittle fractured zone of Ganhe fault. The ore-forming fluid system is characterized by low to moderate temperature and salinity. The fluid compositions are dominated by  $H_2O$ ,  $CO_2$ ,  $Cl^-$ ,  $K^+$  and  $Na^+$ , and the  $CO_2$  content in main metallogenic stage varies between 21.162mol%~32.832mol%. The  $\delta^{13}C_{CO_2}$  values of the fluid system are -3.427‰~8.749‰, indicating the participation of marine carbonate and magmatism. The  $\delta D$  value varies from -111‰ to -78.383‰, the  $\delta^{18}O$  values are 10.527‰~13.565‰ and the  $\delta^{34}S$  value is concentrated between +1‰ and +3‰, which suggesting the ore-forming fluid probably sourced from the magmatic-hydrothermal system, and the metamorphic water sourced from marine carbonate strata also played an important role in the main mineralization stage. In Cenozoic, the large scale upward alkali-rich magma caused the magmatic hydrothermal fluid to circulate and mix with the metamorphic water in the Jinping area of the southern Ailaoshan belt. The mixed fluid extracted gold and other metallogenetic elements from the wall rock and other geological unites, then migrated them to the proper structural spaces, and rapidly precipitated under some favorable physical-chemical condition, finally formed the micro disseminated gold deposit. According to the comprehensive and contrastive study, the Chang'an gold deposit possesses the typical geological-geochemical characteristics of orogenic-type gold deposit and Carlin-type gold deposit, so it should belong to the Carlin-like gold deposit as a transitional type between orogenic-type and Carlin-type gold deposit.

关键词: [成矿流体](#) [稳定同位素](#) [长安金矿床](#) [哀牢山成矿带](#) [碰撞造山](#)

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