

A Study on genesis of enargite from Zijinshan Copper Deposit, Fujian Province, China

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Abstract: Zijinshan copper deposit is one of the hottest spots of high sulfidation epithermal deposits in China, this paper focus on the study of enargite from Zijinshan to reveal its genesis by means of optical microscope and EPMA composition analysis. Results show some definite relationships of replacement reaction, interpenetration and component inheritance among copper sulfides, and establish a genesis sequence of pyrite-enargite-anilite and digenite-covellite. Two phases of hydrothermal alteration can be deducted as it combines with the results of hydrothermal experiments; pyrite and enargite formed in the first phase, other copper sulfides and covellite formed in the second phase. Arsenic carried by magmatic hydrothermal fluid formed enargite by both replace reaction and precipitation. Most of enargites show characteristics of replacing pyrite, and there are also a few enargites formed euhedral columnar crystals in fractures. Minerals in the upper oxidation zone suffered by weathering denudation formed high sulfidation meteoric solution, and infiltrated downward through fractures. It was heating during its downward infiltrating process, and finally returned to the top as it reached the hot igneous rock. Through this process pyrite and enargite took precedence being replaced. This phase transformations occurred between deep minerals and the high sulfidation epithermal achieved by dissolution and reprecipitation, and the solutions formed a circling of infiltration and heating process.

Keywords: Enargite; hydrothermal replacement; dissolution and reprecipitation; hydrothermal experiments; Zijinshan