

Fluctuations in the Chemical Composition of Electrum at the Lebong Tambang Gold Deposit, Southern Sumatra, Indonesia

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Lebong Tambang is a low-sulfidation epithermal gold deposit located at Lebong District, Southern Sumatra, Indonesia. There are many gold prospects in the area. Among them, Lebong Tambang has been well known for its high-grade gold and much amount of gold ore reserve. The main veins of the Lebong Tambang deposit have already been mined out, however exploration of its extension is being conducted. This study is to understand the characteristics of gold mineralization as an initial stage of study of the deposit. The oldest formations recognized in the area consist of mudstone referred to as the Jurassic-Cretaceous Woyla Group. Woyla group is unconformably overlain by andesitic to basaltic lava and tuff of the Neogene Hulusimpang Formation. Most veins are hosted by Woyla Group. In contrast, only a few veinlets are found in the Hulusimpang Formation.

Based on observed mineral association and results of fluid inclusion microthermometry, it is estimated that the temperature of ore-forming fluid was 170° ~ 190°C and the fluid was neutral to slightly alkaline. Characteristic mineral assemblages and their textures suggest that ore-forming fluid boiled since early stage of mineralization and was resulted in electrum deposition in some parts in the deposit. Association of uytenbogaardtite and argentite suggests that there was later lower temperature and oxidizing fluid affect after primary deposition. Presence of gold rich electrum surrounding relatively silver rich electrum and Ag-Se-S minerals is consistent with the change in gold content in electrum which is expected based on mineral stability with respect to fugacity and temperature of the later fluid. In addition, gold rich electrum associated with iron hydroxides and malachite was found in high-grade gold ore. Therefore, there is the possibility that high-grade gold ore was formed as a result of remobilization of gold and/or silver by the later fluid.