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Gold mineralization and geochemistry of the Rixen deposit, Ulu Sokor area, Peninsular Malaysia

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The Rixen deposit is one of the gold occurrences in the Ulu Sokor area, and is a famous gold deposit in Malaysia. It is located in the northern part of Central Belt in Peninsular Malaysia, and to the east of Bentong-Raub Suture Zone that marks the collision of the Sibumasu and East Malaya terranes during Triassic Indosinian Orogeny. The hosts for the deposit are dominantly Permo-Triassic low-grade greenschist facies metavolcanic and metasedimentary rocks. Gold mineralization is structurally controlled and associated with intense wall rock alteration. A major geological structure is a N-S striking fault (F1) that runs through the deposit area. It extends for more than 2 km and probably is part of a regional fault that is associated with the Bentong-Raub Suture Zone.

The gold mineralization in the Rixen deposit occurs within the footwall, or the western part of F1, and is constrained by a set of ENE-trending strike-slip faults that developed relatively late and crosscut F1. Distinct alteration associated with gold mineralization includes silicification, chloritization, and sericitization. Most of the gold grains are hosted by pyrite and associated with very rare galena and chalcopyrite, and these are disseminated in quartz veins or in sheared host rock. Gold occurs as electrum with a variable Ag content (20-46%) and rare Ag-rich gold grains (Ag content 10-12%).

Rare earth elements, such as Th, Ta, and Yb, are studied to see through the effects of the metamorphism and alteration. The Rixen deposit consists of a set of calc-alkali series aluminium-oversaturated volcanic rocks, which are enriched in large ionic lithophile elements and slightly enriched in light rare earth elements. The protolith is a set of intermediate to acidic volcanic rocks, ranging from andesite to rhyolite, with rare mafic rocks. The tectonic setting is in an active continental margin-island arc area, and possibly the deposit is related to subduction.

Based on field investigations and deposit characteristics, a paragenetic sequence is proposed. The formation of F1 during or after development of the Bentong-Raub Suture Zone provides a favourable setting for intrusion emplacement. A later igneous intrusion, probably the diorite dike to the south of the Rixen deposit, led to formation of the ENE-trending strike-slip faults that cut F1. The faults provided sufficient heat and allowed Au-bearing hydrothermal fluids to deposit the auriferous quartz veins. Furthermore, the carbonaceous shale/schist in the hangingwall, or the eastern part of F1, acted as a cap to constrain the gold mineralization to the footwall of F1.

