

SARI

Studi mengenai endapan emas di daerah Mesel, Ratatoto, Sulawesi Utara telah dilakukan oleh banyak peneliti, namun belum ada studi yang detail mengenai prospek di sekitar Mesel, seperti lokasi penelitian ini, yaitu Yance dan Leon. Tujuan dari penelitian ini adalah untuk mengetahui karakteristik alterasi hidrotermal, mineralisasi bijih, karakteristik kimia mineral, serta menginterpretasikan proses pembentukan sistem endapan mineral di daerah penelitian berdasarkan karakteristik tersebut. Metode penelitian yang digunakan berupa analisis megaskopis (deskripsi batuan inti), analisis mikroskopis (petrografi, mikroskopi bijih), *X-Ray Diffraction*, serta SEM-EDX. Hasil penelitian ini menunjukkan bahwa batugamping dan breksi adalah pengontrol alterasi dan mineralisasi di daerah penelitian. Alterasi hidrotermal dikelompokkan menjadi tiga, yaitu alterasi silisifikasi, alterasi silika-kalsit, dan ilit-smektit-klorit±kalsit. Mineral bijih ditemukan sebagai disseminasi, penggantian, dan pengisi rekahan, meliputi pirit, arsenopirit, realgar, orpimen, hematit, dan goetit, dengan mineral gangue yang umum ditemukan adalah kuarsa, kalsit, dolomit, gipsum, klorit, kaolinit, ilit, smektit, dan romboklas. Analisis kimia mineral mengidentifikasi beberapa unsur seperti Fe, S, As, Cu, Au, Ag, Sb, Cd, Co, dan Ni dengan rata-rata kandungan Co lebih dari Ni dan rata-rata rasio Co/Ni pada pirit dan arsenopirit menunjukkan genesis sedimenter. Pembentukan mineralisasi emas di daerah penelitian diinterpretasikan menjadi empat tahapan yaitu (1) pembentukan batugamping di lingkungan laut dangkal; (2) terjadi pengangkatan, pembentukan breksi, dan intrusi andesit pra-mineralisasi; (3) intrusi *syn*-mineralisasi yang mengalterasi batuan dan mengendapkan mineral bijih; (4) intrusi *post*-mineralisasi dan penurunan suhu pada sistem hidrotermal hingga (5) interaksi dengan air meteorik dan oksigen menyebabkan proses supergen.

Kata kunci: Alterasi hidrotermal, mineralisasi emas tipe Carlin, genesis endapan emas, Yance, Leon

ABSTRACT

Study of gold deposit in Mesel, Ratatotok, North Sulawesi has been conducted by numerous experts, but there has been no detailed research on other prospects near Mesel, like Yance and Leon where this study is conducted. The objectives of this study is to determine hydrothermal alteration characteristics, ore mineralization, mineral chemistry, and to explain the origin of the deposit based on its defining characteristics. Core sample description, microscopic analyses (petrography, ore microscopy), X-Ray Diffraction, and SEM-EDX are the methods used to identify those characteristics. The results of these analyses indicate that limestone and collapse breccia controlled alteration and mineralization in this area. Hydrothermal alteration that are developed in this area are silicification, silica-calcite, illite-smectite-chlorite±calcite. Ore minerals are found as dissemination, replacement, and open-space fill, such as pyrite, arsenopyrite, realgar, orpiment, hematite, and goethite, with gangue minerals such as quartz, calcite, dolomite, gypsum, chlorite, kaolinite, illite, smectite, and rhomboclase. Analysis on mineral chemistry identify numerous elements, essentially Fe, S, As, Cu, Au, Ag, Sb, Cd, Co, and Ni where average Co content is higher than average Ni and average Co/Ni ratio in pyrite and arsenopyrite indicate sedimentary origin. The genesis of the gold deposit in Yance and Leon are broke down into several steps, (1) formation of limestone in shallow marine; (2) uplift, development of collapse breccia and pre-mineralization andesite intrusion; (3) syn-mineralization intrusion that caused alteration and precipitation of ore minerals; (4) post-mineralization intrusion and the development of hydrothermal system to the point of (5) surface condition impact lead to supergene processes.

Keywords: Hydrothermal alteration, Carlin-type gold mineralization, gold deposit genesis, Yance, Leon