ABSTRAK

Prospek Onto terletak di bagian timur Pulau Sumbawa, Provinsi Nusa Tenggara Barat, Indonesia. Pulau ini terletak dalam busur magmatik Sunda-Banda yang berarah dari barat ke timur, yang terdiri dari batuan vulkanik dari Miosen awal hingga Holosen. Onto adalah salah satu prospek yang sangat potensial dan memiliki nilai ekonomi yang signifikan di antara endapan bijih di Indonesia. Tujuan dari penelitian ini adalah untuk menjelaskan karakteristik mieralisasi dan evolusi fluida hidrotermal pada sistem transisi porfiri-epitermal sulfidasi tinggi berdasarkan analisis petrografi, mikroskopis bijih, isotop sulfur dan inklusi fluida. Delapan unit litologi diidentifikasi yaitu porfiri intermineral akhir, porfiri intermineral awal, porfiri awal, intrusi *dike* dan *sill*, andesit penutup, unit batuan sedimen, breksi polimik (*diatreme*), andesit awal. Alterasi yang berkembang pada sistem transisi porfiri-epitermal sulfidasi tinggi prospek onto adalah kuarsa-Alunit-pirofilit ± diaspor, dikit ± anhidrit dan sulfur murni yang berasosiasi dengan mineral sulfida kovelit-pirit.

Sistem mineralisasi prospek Onto terbentuk secara diseminasi pada host rock serta urat stockwork tipe A dan B yang terkonsentrasi pada fase porfiri awal dan porfiri intermineral awal. Batas kelurusan zona mineralisasi searah barat laut-tenggara, dan di kedua sisi pusat intrusi diorit. Mineral sulfida didominasi oleh kovelit-pirit yang menggantikan kalkopirit atau bornit. Kandungan mineralisasi yang lebih tinggi umumnya terjadi pada alterasi argilik lanjut alunit-pirofilit ± disapor pada batuan porfiri awal dan porfiri intermineral awal. Intensitas mineralisasi menurun pada tubuh Porfiri intermineral akhir.

Dari analisis fluida inklusi mikrotermometri pada urat kuarsa yang terkait dengan batuan intrusi di deposit onto inklusi fluida yang terlihat sangat bervariasi antara lain inklusi tipe bifase (*Liquid+vapour*) dan polifase (*Liquid+vapour+solid*) serta fase solid berupa halit (NaCl) dan kalkopirit, di ikuti inklusi sekunder dan pseudosekunder. Bentuk inklusi fluida sebagian dikendalikan oleh kristalografi mineral induknya yang kemungkinan adalah mineral solid halit, kalkopirit, pirit atau mineral oksida hematit.

Dari data pengukuran salinitas inklusi intrusi porfiri Onto dihitung dari temperatur pelelehannya dimana tingkat salinitas hasil pengukuran berkisar antara 5.71 hingga 10.27 wt% NaCl dengan rata-rata sekitar 7.94 wt% NaCl equiv, rentang suhu homogenisasi rata-rata (275ºC dan 377 ºC). Pengukuran $\delta^{34}S$ sulfida berada antara -1.0 hingga 1.4‰. Data isotop sulfat-sulfida menunjukkan pendekatan umum terhadap kesetimbangan isotop. Suhu yang di ukur berdasarkan temperature homogenisasi dari inklusi fluida untuk kesetimbangan isotop pada deposit Onto umumnya berada antara 275°C hingga 377°C.

Kata Kunci: mineralogi, inklusi fluida, porfiri, epitermal sulfidasi tinggi (HSE), Onto

ABSTRACT

Onto prospect is located in the eastern part of Sumbawa Island, West Nusa Tenggara Province, Indonesia. The island lies within the Sunda-Banda magmatic arc, which extends from west to east, consisting of volcanic rocks from the early Miocene to the Holocene. Onto is one of the highly potential prospects with significant economic value among ore deposits in Indonesia. The purpose of this research is to explain the characteristics of mineralization and the evolution of hydrothermal fluids in the transition system of high-sulfidation porphyry-epithermal based on petrographic analysis, ore microscopy, sulfur isotopes, and fluid inclusions. Eight lithological units have been identified, namely late intermineral porphyry, early intermineral porphyry, early porphyry, dike and sill intrusions, andesite dome, sedimentary rock units, polymictic breccia (diatreme), and early andesite. The alteration that developed in the transition porphyry-epithermal high sulfidation system at the Onto prospect is quartz-Alunite-pyrophyllite ± diaspora, dickite ± anhydrite, and pure sulfur associated with covellite-pyrite sulfide minerals.

The mineralization system of the Onto prospect formed disseminated within the host rock as well as A and B-type stockwork veins concentrated in the early porphyry and early inter-mineral porphyry phases. The boundaries of the mineralization zone trend northwest-southeast, flanking both sides of the diorite intrusion center. Sulfide minerals are dominated by covellite-pyrite replacing chalcopyrite or bornite. Higher mineralization contents generally occur within advanced argillic alteration alunite-pyrophyllite ± diaspore in the early porphyry and early inter-mineral porphyry rocks. Mineralization intensity decreases in the late inter-mineral porphyry body.

Fluid inclusion microthermometric analysis of quartz veins associated with intrusive rocks in the Onto deposit reveals highly variable fluid inclusion types, including bifluid (liquid+vapour) and polyphase (liquid+vapour+solid) inclusions, as well as solid phases such as halite (NaCl) and chalcopyrite. The shape of fluid inclusions is partly controlled by the crystallography of the host minerals which is likely solid halite, chalcopyrite, pyrite, or hematite oxide minerals.

From the salinity measurements of porphyry intrusion fluid inclusions at Onto, calculated from their melting temperatures, the salinity levels range from 5.71 to 10.27 wt% NaCl, with an average of approximately 7.94 wt% NaCl equiv. The homogenization temperature averages range from 275℃ to 377 ℃. Measurements of δ34S of sulfides range from -1.0 to 1.4‰. Sulfate-sulfide isotope data indicate a general approach to isotopic equilibrium. The measured temperatures based on fluid inclusion homogenization temperatures for isotopic equilibrium at Onto deposit generally range from 275°C to 377°C.

Keywords: mineralogy, fluid inclusion, porphyry, high sulfidation epithermal (HSE), Onto