

SARI

Penelitian dilakukan di desa Naflo, Kecamatan Mangoli Timur, Kabupaten Kepulauan Sula, Maluku Utara. Area penelitian termasuk ke dalam bagian mikrokontinen banggai-sula yang berasal dari pecahan benua australia. Proses tektonisme yang kompleks berpotensi menghasilkan endapan bijih ekonomis di area penelitian. Belum ada penelitian yang dilakukan sebelumnya di area penelitian mengenai kehadiran mineralisasi bijih. Tujuan dari penelitian ini untuk memahami kondisi tatanan geologi serta karakteristik alterasi dan mineralisasi untuk mengetahui potensi kehadiran alterasi magmatik-hidrotermal. Metode penelitian terdiri dari studi pendahuluan, pengambilan data dan sampel, analisis laboratorium, integrasi dan interpretasi data, dan penyusunan laporan. Analisis laboratorium yang dilakukan berupa petrografi, mineragrafi, dan Inductively Coupled Plasma Mass Spectrometry (ICP-MS). Litologi penyusun daerah penelitian dibagi menjadi enam satuan geologi dari tua ke muda meliputi satuan metamorf, satuan granit amfibol, satuan gabro, satuan diabas, satuan granit biotit, dan satuan endapan pasir-kerakal. Alterasi hidrotermal ditemukan pada batuan mafik gabro dan diabas dengan intensitas rendah-sedang berupa asosiasi klorit + kuarsa + serisit, epidot + klorit + serisit, epidot + klorit + aktinolit, dan serisit + epidot + klorit. Kehadiran mineralisasi di daerah penelitian terdapat pada batuan gabro, diabas, dan granit secara disseminasi. Mineral bijih yang ditemukan berupa pirit, magnetit, sfalerit, kalkopirit, dan hematit. Data geokimia batuan menunjukkan bahwa granit biotit berasosiasi dengan zona subduksi pada *volcanic arc* hingga *post-collision* dengan tipe granit S peralumina dan memiliki seri magma kalk-alkalin. Pada batuan granit biotit tidak dijumpai adanya pengkayaan unsur ekonomis tertentu. Data geokimia batuan gabro menunjukkan magma berasosiasi dengan proses subduksi dan terbentuk pada setting *volcanic arc* yang berkomposisi kalk-alkalin. Kehadiran struktur geologi berupa NE-SW menjadi pengontrol alterasi dan mineralisasi di area penelitian dengan jenis struktur berupa sesar turun mengiri. Tahapan mineralisasi pada area penelitian dibagi menjadi tahap magmatik (magnetit), tahap hidrotermal (pirit, kalkopirit, dan sfalerit), dan supergen (hematit). Mineralisasi ini berasosiasi dengan fluida magmatik-hidrotermal dengan pengkayaan kadar Fe-Cr-Ti.

Kata kunci: Mangoli, mikrokontinen Banggai-Sula, magmatik-hidrotermal, geokimia batuan

ABSTRACT

This research was held in Naflo village, East Mangoli District, Sula Islands Regency, North Maluku. This area is part of the Banggai-Sula microcontinent, originating from fragments of the Australian continent. The complex tectonism process has the potential to produce economic ore deposits in the research area. No previous research has been conducted in the area regarding the presence of ore mineralization. The aim of this research is to understand the geological setting conditions and the characteristics of alteration and mineralization to determine the potential presence of magmatic-hydrothermal alteration. The research method The research method consists of a preliminary study, data and sample collection, laboratory analysis, data integration and interpretation, and report preparation. Laboratory analyses included petrography, mineralogy, and Inductively Coupled Plasma Mass Spectrometry (ICP-MS). The lithology of the research area is divided into six geological units from oldest to youngest: metamorphic unit, granite amphibole unit, gabbro unit, diabase unit, granite biotite unit, and sand-gravel deposit unit. Hydrothermal alteration was found in the mafic rocks of gabbro and diabase-basalt with low to medium intensity, represented by associations of chlorite + quartz + sericite, epidote + chlorite + sericite, epidote + chlorite + actinolite, and sericite + epidote + chlorite. Mineralization in the research area was found in gabbro, diabase-basalt, and granite rocks in a disseminated form. Ore minerals discovered include pyrite, magnetite, sphalerite, chalcopyrite, and hematite. Geochemical data of the rocks indicate that granite intrusion is associated with a subduction zone in a volcanic arc to post-collision setting with S-type peraluminous granite and a calc-alkaline magma series. No enrichment of specific economic elements was found in the granite intrusion rocks. Geochemical data of gabbro rocks suggest magma associated with subduction processes formed in a calc-alkaline volcanic arc setting. The presence of NE-SW geological structures controls alteration and mineralization in the research area with structures such as left-lateral normal faults. The stages of mineralization in the research area are divided into magmatic (magnetite), hydrothermal (pyrite, chalcopyrite, and sphalerite), and supergene (hematite) stages. This mineralization is associated with magmatic-hydrothermal fluids enriched in Fe-Cr-Ti.

Keywords: Mangoli, Banggai-Sula microcontinent, magmatic-hydrothermal, whole-rock geochemistry