

ABSTRAK

GEOLOGI DAN KARAKTERISTIK PENGAYAAN KOBALT DI BLOK X, DAERAH GANDA-GANDA, MOROWALI UTARA, SULAWESI TENGAH

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Unsur kobalt merupakan salah satu unsur yang berperan sebagai bahan baku baterai, terutama pada baterai kendaraan listrik (*Electric Vehicle*). Kebutuhan akan kobalt terus meningkat sejalan dengan tingginya kebutuhan akan kendaraan listrik terutama di masa sekarang, sedangkan disisi lain penelitian dan eksplorasi mengenai kobalt di Indonesia masih terbilang sedikit dibandingkan dengan unsur lain seperti nikel. Berlandaskan hal tersebut, penulis melakukan penelitian mengenai pengayaan unsur kobalt pada endapan laterit di daerah potensial yang terdapat di Pulau Sulawesi. Daerah Ganda-Ganda, Morowali Utara, Sulawesi Tengah memiliki litologi batuan dasar yang tersusun oleh batuan ultramafik, sebagai batuan penghasil endapan laterit, yang berpotensi pembawa unsur logam strategis seperti kobalt. Penelitian ini bertujuan untuk mengkaji geologi meliputi kondisi geomorfologi, litologi, struktur geologi, lateritisasi, dan karakteristik pengayaan kobalt pada Blok X. Metode yang digunakan meliputi pemetaan geologi, analisis data geologi, dan analisis data geokimia *assay* unsur hasil metode *X-Ray Fluorescence* (XRF) pada 14 *borehole* geokimia. Hasil penelitian menunjukkan bahwa batuan dasar daerah penelitian terdiri dari satuan peridotit dan dunit. Zonasi laterit tersusun dari tanah penutup, limonit, saprolit, dan batuan dasar. Unsur kobalt terakumulasi dominan di zona limonit dengan kadar mencapai 0,14% dan memiliki korelasi positif terhadap MnO dan Fe₂O₃. Mineral utama pengikat kobalt adalah goetit, hematit, dan mangan oksida (*manganese wad*). Proses pengayaan kobalt dikontrol oleh intensitas lateritisasi, ketebalan lapisan limonit, dan kemiringan lereng. Studi ini menunjukkan bahwa pengayaan kobalt di daerah penelitian berkaitan erat dengan faktor geologi dan dapat menjadi acuan dalam eksplorasi dan pengelolaan sumber daya mineral laterit di kemudian hari.

Kata kunci: kobalt, laterit, Morowali, limonit, ultramafik

ABSTRACT

GEOLOGY AND CHARACTERISTICS OF COBALT ENRICHMENT IN BLOCK X, GANDA-GANDA AREA, NORTH MOROWALI, CENTRAL SULAWESI

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Cobalt is one of the essential elements used as a raw material for batteries, particularly in electric vehicle (EV) batteries. The demand for cobalt continues to increase in line with the growing demand for electric vehicles, especially in recent times. On the other hand, research and exploration of cobalt in Indonesia remain relatively limited compared to other elements such as nickel. Based on this, the author conducted a study on the enrichment of cobalt in laterite deposits in a potential area on Sulawesi Island. Ganda-Ganda area, located in North Morowali, Central Sulawesi, is underlain by ultramafic bedrock lithology, which serves as the parent rock for laterite deposits and holds the potential to host strategic metals such as cobalt. This study aims to examine the geological aspects, including geomorphological conditions, lithology, geological structures, lateritization processes, and the characteristics of cobalt enrichment within Block X. The methods used include geological mapping, geological data analysis, and geochemical analysis of elemental assay data obtained from 14 geochemical borehole samples using the X-Ray Fluorescence (XRF) method. The results show that the bedrock in the study area consists of peridotite and dunite units. The laterite profile is composed of topsoil, limonite, saprolite, and bedrock layers. Cobalt is predominantly accumulated in the limonite zone with concentrations reaching up to 0.14%, and it shows a positive correlation with MnO and Fe₂O₃. The main cobalt-binding minerals are goethite, hematite, and manganese oxide (manganese wad). The cobalt enrichment process is controlled by the intensity of lateritization, the thickness of the limonite layer, and slope gradients. This study demonstrates that cobalt enrichment in the study area is closely related to geological factors and can serve as a reference for future exploration and management of lateritic mineral resources.

Keywords: cobalt, laterite, Morowali, limonite, ultramafic