

ABSTRAK

KAJIAN KORELASI GEOKIMIA Ni DENGAN UNSUR PENDAMPING LAIN PADA MORFOLOGI PERBUKITAN DAN RAWA DAERAH ROUTA, KABUPATEN KONAWE, PROVINSI SULAWESI TENGGARA

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Endapan nikel laterit di daerah Rوتا, Konawe, Sulawesi Tenggara berkembang di atas batuan ultramafik berupa peridotit dan dunit yang merupakan bagian dari Kompleks Ofiolit Sulawesi Timur. Daerah penelitian dicirikan oleh dua lingkungan geokimia yang kontras yaitu zona oksidatif pada morfologi perbukitan dan zona reduktif pada rawa. Penelitian ini bertujuan mengkaji pengaruh kondisi geomorfologi terhadap korelasi geokimia Ni dengan unsur pendamping (Fe, Co, Mg, Mn, dan S) menggunakan data inti bor yang dianalisis melalui uji XRF, pengolahan spasial dengan *ArcGIS* dan *CorelDRAW*, serta Korelasi Spearman menggunakan SPSS. Geomorfologi daerah penelitian tersusun atas dua satuan bentuk lahan, yaitu perbukitan denudasional dan rawa, yang mengendalikan kondisi geokimia melalui perbedaan drainase. Geologi tersusun atas Satuan Peridotit Sulawesi Timur, Satuan Dunit Sulawesi Timur, Satuan Konglomerat Langkowala, dan Endapan Rawa, dengan struktur berupa sesar naik, sesar normal, dan sesar mendatar. Profil laterit tersusun atas lima zona yaitu limonit, saprolit, dan *bedrock* yang terbentuk melalui pelapukan in situ di zona perbukitan, serta *transported limonite* dan sedimen yang terbentuk melalui proses transportasi dan pengendapan di zona rawa. Pada zona oksidatif, goetit dan mineral mangan oksida berperan sebagai *carrier* utama Ni, tercermin dari korelasi kuat Ni-Fe ($r_s = 0,712$), Ni-Co ($r_s = 0,699$), Ni-Mn ($r_s = 0,666$), dan Ni-Mg negatif kuat ($r_s = -0,714$) pada saprolit, serta korelasi Ni-S negatif ($r_s = -0,257$ hingga $-0,368$) akibat pelindian SO_4^{2-} . Pada zona reduktif, kondisi anoksik mendestabilisasi *carrier* Ni sehingga korelasi Ni-Fe berbalik negatif ($r_s = -0,181$), Ni-Co mencapai nilai tertinggi ($r_s = 0,776$), dan Ni-S berbalik positif ($r_s = 0,134-0,142$) akibat akumulasi sulfur organik dari gambut. Kombinasi Ni-Fe negatif, Ni-Co tinggi, dan Ni-S positif menjadi penciri geokimia zona reduktif, sedangkan Ni-Fe kuat, Ni-Mg negatif kuat, dan Ni-S negatif menjadi penciri zona oksidatif.

Kata kunci: Geokimia, Korelasi Spearman, Nikel, Oksidatif, Reduktif, Sulawesi Tenggara

ABSTRACT

A STUDY OF THE GEOCHEMICAL CORRELATION BETWEEN Ni AND OTHER ACCOMPANYING ELEMENTS IN RELATION TO THE MORPHOLOGY OF HILLS AND WETLAND IN THE ROUTA AREA, KONAWE REGENCY, SOUTHEAST SULAWESI PROVINCE

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The lateritic nickel deposits in the Rوتا area, Konawe, Southeast Sulawesi, occur on ultramafic rocks consisting of peridotite and dunite, which are part of the East Sulawesi Ophiolite Complex. The study area is characterized by two contrasting geochemical environments: an oxidative zone in the hilly terrain and a reductive zone in the swamp. This study aims to examine the influence of geomorphological conditions on the geochemical correlation of Ni with accompanying elements (Fe, Co, Mg, Mn, and S) using core sample data analyzed via XRF testing, spatial processing with ArcGIS and CorelDRAW, and Spearman's correlation using SPSS. The geomorphology of the study area consists of two landform units: denudational hills and swamps, which control geochemical conditions through differences in drainage. The geology consists of the Timur Sulawesi Peridotite Unit, the East Sulawesi Dunite Unit, the Langkowala Conglomerate Unit, and Swamp Deposits, with structures in the form of thrust faults, normal faults, and strike-slip faults. The laterite profile consists of five zones: limonite, saprolite, and bedrock, which formed through in situ weathering in the hilly zone; and transported limonite and sediments, which formed through transport and deposition in the swamp zone. In the oxidative zone, goethite and manganese oxide minerals act as the primary carriers of Ni, as reflected by the strong correlations between Ni-Fe ($r_s = 0.712$), Ni-Co ($r_s = 0.699$), Ni-Mn ($r_s = 0.666$), and a strongly negative Ni-Mg correlation ($r_s = -0.714$) in saprolite, as well as a negative Ni-S correlation ($r_s = -0.257$ to -0.368) due to SO_4^{2-} leaching. In the reductive zone, anoxic conditions destabilize Ni carriers, causing the Ni-Fe correlation to reverse to negative ($r_s = -0.181$), Ni-Co to reach its highest value ($r_s = 0.776$), and Ni-S to reverse to positive ($r_s = 0.134-0.142$) due to the accumulation of organic sulfur from peat. The combination of a negative Ni-Fe correlation, a high Ni-Co correlation, and a positive Ni-S correlation characterizes the geochemistry of the reductive zone, whereas a strong Ni-Fe correlation, a strongly negative Ni-Mg correlation, and a negative Ni-S correlation characterizes the oxidative zone.

Keywords: Geochemistry, Nickel, Oxidative, Reductive, Spearman Correlation, Southeast Sulawesi