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**Komposisi dan Karakteristik Mineral pada Serpentinit di Zona Sesar Aceh, Kecamatan Tangse, Kabupaten
Pidie, Provinsi Aceh**
Muhammad Aliga Qudaifi, Ir. Gayatri Indah Marliyani, S.T., M.Sc., Ph.D., IPM.; Ir. Nugroho Imam Setiawan, S.T., M.T
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# INTISARI

Serpentinit di Kecamatan Tangse, Kabupaten Pidie, Aceh, didominasi oleh mineral serpentin hasil hidrasi batuan ultramafik. Penelitian ini bertujuan mengidentifikasi komposisi dan karakteristik mineral serpentin beserta mineral penyertanya serta menganalisis variasinya terhadap posisi relatif terhadap inti Great Sumatran Fault. Pengambilan data dilakukan pada tebing Jalan Keumala–Geumpang yang tegak lurus terhadap arah sesar, dengan 12 sampel batuan yang terdiri atas 8 sampel di sisi selatan, 1 sampel pada inti sesar, dan 3 sampel di sisi utara. Analisis petrografi menunjukkan dominasi antigorit dengan kehadiran lizardit dalam proporsi lebih kecil, serta mineral sisa berupa olivin dan ortopiroksen pada beberapa sampel. Mineral aksesoris yang teridentifikasi meliputi magnetit, talk, dan oksida besi, sedangkan mineral ubahan lanjut berupa kalsit. Tekstur yang berkembang meliputi *mesh* dan *bastite*, *ribbon* lizardit, *banded microstructure* pada urat antigorit, massa dasar antigorit bertekstur nematoblastik, serta *bastite* antigorit. Analisis SEM–EDS melengkapi hasil petrografi dengan menunjukkan morfologi lizardit yang lebih halus dan relatif rata dibandingkan antigorit, serta mengidentifikasi mineral berukuran sangat halus seperti brusit dan kromit. Interpretasi spasial menunjukkan bahwa semakin mendekati inti sesar, serpentinit semakin didominasi oleh antigorit hingga mencapai sekitar 80% pada inti sesar. Dominasi ini ditafsirkan melalui rekristalisasi dinamik akibat deformasi intens dan/atau redistribusi mekanis batuan yang telah kaya antigorit sejak zona subduksi. Meskipun lizardit lebih melimpah di sekitar sesar minor, hubungan tekstural menunjukkan bahwa lizardit terbentuk lebih awal dan kemudian di*overprint* oleh antigorit, sehingga tidak dikontrol oleh sesar minor. Mineral sisa lebih umum pada sampel kurang terdeformasi, sedangkan kalsit terkonsentrasi di sekitar inti sesar.

Kata kunci: Petrografi, SEM-EDS, serpentinit, struktur sesar

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# ABSTRACT

*Serpentinite in Tangse District, Pidie Regency, Aceh, is dominated by serpentine minerals formed from the hydration of ultramafic rocks. This study aims to identify the composition and characteristics of serpentine minerals and their associated minerals, as well as to analyze their variation relative to the position of the Great Sumatran Fault core. Data were collected along the Keumala–Geumpang road outcrop, which is oriented perpendicular to the fault direction. A total of 12 rock samples were obtained, consisting of 8 samples from the southern side of the fault core, 1 sample from the fault core, and 3 samples from the northern side. Petrographic analysis shows that the rocks are dominated by antigorite, with lizardite present in smaller proportions. Relict minerals, including olivine and orthopyroxene, are still observed in several samples. Identified accessory minerals include magnetite, talc, and iron oxides, while calcite occurs as a late-stage alteration mineral. Observed textures include mesh and bastite, ribbon lizardite, banded microstructure in antigorite veins, nematoblastic antigorite groundmass, and antigorite bastite. SEM–EDS analysis complements petrographic observations by revealing that lizardite exhibits finer and relatively smoother morphology compared to antigorite, and also identifies very fine-grained minerals such as brucite and chromite. Spatial interpretation indicates that serpentinite becomes increasingly dominated by antigorite toward the fault core, reaching approximately 80% at the core. This dominance is interpreted to result from dynamic recrystallization associated with intense deformation and/or mechanical redistribution of rocks that were already antigorite-rich since the subduction stage. Although lizardite is relatively more abundant near minor faults, textural relationships indicate that lizardite formed earlier and was subsequently overprinted by antigorite, suggesting that its distribution is not controlled by minor faults. Relict minerals are more common in less deformed samples, whereas calcite is concentrated near the fault core.*

*Keywords: Fault structure, petrography, SEM-EDS, Serpentinite*