

# **GEOLOGI, ALTERASI, DAN MINERALISASI DAERAH SRIMULYO DAN SEKITARNYA, KECAMATAN TIRTOYUDO, KABUPATEN MALANG, PROVINSI JAWA TIMUR**

Anisa Rizkiyati

## **SARI**

Daerah penelitian berada pada Kecamatan Tirtoyudo, Kabupaten Malang, Provinsi Jawa Timur. Secara geografis, daerah penelitian berada pada zona UTM 49S dengan koordinat X : 697507,563 mE – 702507,566 mE dan Y : 9084094,266 mN - 9080094,277 mN dengan luas wilayah 20 km<sup>2</sup>. Metodologi penelitian yang dilakukan selama penelitian terdapat 5 metode, yaitu metode survei dan pemetaan geologi, metode analisis laboratorium dan studio, metode penentuan zona alterasi, metode penentuan perkiraan sumber panas, dan metode penentuan mineralisasi bijih. Daerah penelitian secara fisiografis merupakan bagian dari Zona Pegunungan Selatan yang terdiri atas batuan berumur Tersier. Geomorfologi Kecamatan Tirtoyudo dan sekitarnya diinterpretasikan terdapat aktivitas gunung api purba yang dapat diketahui dengan adanya morfologi perbukitan melingkar (*circular feature*) yang terletak sekitar 4 km tenggara daerah penelitian. Satuan geomorfologi pada daerah penelitian dibagi menjadi 2 satuan, yaitu satuan Perbukitan Aliran Lava Curam (V9) dan satuan Perbukitan Aliran Piroklastik Curam (V10). Pada daerah penelitian terdapat 3 struktur geologi yang diperkirakan, yaitu sesar normal yang berarah timurlaut – baratdaya (NE-SW), sesar geser kanan yang berarah timurlaut – baratdaya (NE-SW), dan sesar geser kiri yang berarah barat – timur (W-E). Stratigrafi daerah penelitian dikelompokkan menjadi 6 satuan batuan, dari tua ke muda, yaitu Satuan Breksi Tuf Polimik, Satuan Tuf, Satuan Breksi Tuf+Juvenil Polimik, Satuan Andesit, Satuan Breksi Andesit Polimik, dan Satuan Batupasir. Sebagian daerah penelitian telah mengalami alterasi hidrotermal dengan intensitas lemah hingga intensif. Zona alterasi pada daerah penelitian terbagi menjadi tiga zona, yaitu: zona Kuarsa-Illit-Smektit-Klorit, zona Kuarsa-Illit-Smektit-Kaolinit, dan zona Kuarsa-Kaolinit-Dikit-Pirofilit±Alunit±Diaspor. Alterasi hidrotermal pada daerah penelitian terbentuk pada pH fluida bersifat asam-netral dengan temperatur pembentukan mineral berkisar dari 140° – 260° C. Mineralisasi yang berupa mineral pirit hadir secara tersebar (*disseminated*) dan sebagai matriks dalam ukuran halus (*fine grained sulphides*). Sistem endapan yang terdapat pada daerah penelitian diperkirakan sebagai endapan tipe epitermal sulfidasi tinggi (*high sulphidation*) berdasarkan kehadiran tekstur *vuggy quartz*, pola mineralisasi yang menyebar, serta kehadiran mineral alunit, pirofilit, diaspor, dan dikit.

Kata kunci: alterasi, mineralisasi, epitermal sulfidasi tinggi

# **GEOLOGY, ALTERATION, AND MINERALISATION AT SRIMULYO AND ITS SURROUNDING AREA, TIRTOYUDO DISTRICT, MALANG REGENCY, EAST JAVA PROVINCE**

Anisa Rizkiyati

## **ABSTRACT**

The research area is located at Tirtoyudo District, Malang Regency, East Java Province. Geographically located on UTM 49S Zone with its coordinates on X : 697507,563 mE – 702507,566 mE and Y : 9084094,266 mN - 9080094,277 mN, within 20 km<sup>2</sup> area. The methodology used during the research consists of five methods, which are the survey and geological mapping method, the laboratory and studio analysis method, the determination of alteration zones method, the determination of interpreted heat source method, and the determination of ore mineralisation method. The research area based on its physiography is a part of Southern Mountain Zone which is composed of Tertiary rocks. Geomorphology of Tirtoyudo District and its surrounding area is interpreted as an ancient volcano activity that could be known by its circular morphology called circular feature which is located about 4 km southeastward of the research area. Geomorphology of research area are divided into 2 units, which are Steep Lava Flow Hills unit (V9) and Steep Pyroclastic Flow Hills unit (V10). At the research area, there are 3 interpreted geological structures, which are normal fault with northeast to southwest trending (NE-SW), right strike slip fault with northeast to southwest trending (NE-SW), and left strike slip fault with west to east trending (E-W). Stratigraphy of the research area consists of six lithological units, from old to young, which are Polymict Tuff Breccia unit, Tuff unit, Polymict Tuff+Juvenile Breccia unit, Andesite unit, Polymict Andesite Breccia unit, and Sandstone unit. Half of the research area has undergone hydrothermal alteration with weak to intensive intensity. Alteration zone of the research area divided into three zones, which are Quartz-Illite-Smectite-Chlorite zone, Quartz-Illite-Smectite-Kaolinite zone, and Quartz-Kaolinite-Dickite-Pyrophyllite±Alunite±Diaspore. Hydrothermal alteration on research area formed at acid to neutral fluid pH range with temperature range from 140° to 260° C. Mineralisation in the form of pyrite present in disseminated pattern and fine grained sulphides as matrix. Ore bearing system of the research area could be classified as high sulphidation epithermal type based on vuggy quartz texture, disseminated mineralisation pattern, and the presence of alunite, pyrophyllite, diaspore, and dickite.

Keywords: alteration, mineralisation, high sulphidation epithermal