ABSTRAK

Maharani Syahputri, NIM 4193240002 (2023), Identifikasi Struktur Bawah Permukaan dan Kandungan Mineral Batuan Area Panas Bumi di Desa Payung Kabupaten Karo Menggunakan Metode Geomagnet.

Penelitian ini dilakukan dengan tujuan mengetahui penyebaran anomali magnet bawah permukaan dan menentukan jenis serta kandungan batuan berdasarkan nilai suseptibilitas di daerah panas bumi desa Payung kabupaten Karo. Pengukuran dilapangan menggunakan alat PPM (*Proto Precision Magnetometer*), GPS (*Global Position System*) dan kompas. Data diolah menggunakan software Mag2dc dan surfer 13, sehingga memperoleh hasil suseptibilitas. Penentuan kandungan batuan diuji menggunakan XRD *(X-Ray Diffraction*). Pengambilan data geomagnetik di lapangan sebanyak 40 titik pengukuran. Hasil penelitian menunjukkan adanya variasi kuat medan magnet di setiap titik dengan nilai berkisar antara 20 nT sampai 380 nT. Hal ini menunjukkan bahwa daerah panas bumi di desa Payung memiliki nilai suseptibilitas berkisar antara 0,0013 x 10^3 sampai 0,0088 x 10^3 dan merupakan batuan beku berupa batuan lava andesit dan batuan piroklastik. Batuan beku dan batuan piroklastik merupakan batuan penyusun dari panas bumi yang ada di area penelitian. Mineral penyusun batuan area panas bumi di desa Payung merupakan mineral C_2N_2Zn, Asbecasite ($As_6Be_2Ca_3O_{20}Si_2Ti$) dan mineral Quartz (SiO_2). Mineral C_2N_2Zn memiliki sistem kristal orthorhombic dengan ukuran kristal a= 12,2842Å b= 7,6537Å c= 7,5151Å. Sistem kristal pada mineral Asbecasite adalah trigonal (*hexagonal axes*) dengan ukuran kristal a= 8,3180Å c= 15,2640Å. Quartz dengan sistem triclinic (*anorthic*) dengan ukuran kristal a= 9,9320Å b= 17,2160Å c= 81,8640Å.

***Kata kunci**: metode geomagnet, nilai anomali, suseptibilitas, XRD*

ABSTRACT

Maharani Syahputri, NIM 4193240002 (2023), Identification of Subsurface Structure and Mineral Content of Geothermal Area Rocks in Payung Village, Karo Regency Using Geomagnetic Methods.

This research was carried out with the aim of knowing the distribution of subsurface magnetic anomalies and determining the type and content of rocks based on susceptibility values in the geothermal area of Payung village, Karo district. Field measurements use PPM (Proto Precision Magnetometer), GPS (Global Position System) and compass. The data was processed using Mag2dc and surfer 13 software, to obtain susceptibility results. Determination of rock content was tested using XRD (X-Ray Diffraction). Geomagnetic data collection in the field at 40 measurement points. The research results show that there are variations in magnetic field strength at each point with values ranging from 20 nT to 380 nT. This shows that the geothermal area in Payung village has a susceptibility value ranging from 0.0013 x to 0.0088 x and is igneous rock in the form of andesite lava rock and pyroclastic rock. Igneous rocks and pyroclastic rocks are the building blocks of geothermal energy in the research area. The minerals that make up the rocks of the geothermal area in Payung village are the minerals, Asbecasite () and the mineral Quartz (). The mineral has an orthorhombic crystal system with crystal size a= 12.2842Å b= 7.6537Å c= 7.5151Å. The crystal system of the Asbecasite mineral is trigonal (hexagonal axes) with crystal size a= 8.3180Å c= 15.2640Å. Quartz with a triclinic (anorthic) system with crystal size a= 9.9320Å b= 17.2160Å c= 81.8640Å.

Key words: geomagnetic method, anomaly value, susceptibility, XRD.