

The Reservoir Rock Properties of Heybeli Geothermal Area

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Heybeli geothermal area is located at 25 km southeast of Afyonkarahisar province (West Anatolia/Turkey). It is one of the most important geothermal sites in the region. There are one thermal spring and eight thermal wells, were drilled by governmental agencies and private companies, with a depth between 240 to 650 meters. Thermal water has been utilised for greenhouse heating and thermal tourism. Temperature and electrical conductivity (EC) values of thermal waters are within the range of 29.3°C to 54.7°C and 587 to 3580 $\mu\text{mho/cm}$, respectively. Thermal waters are of the Na-Ca-HCO₃ and Na-Ca-HCO₃-SO₄ type.

The basement rocks in the study area are Paleozoic aged Afyon metasedimentary group, consisting of schists and recrystallized limestones. This basement is overlain by Senozoic marl-conglomerate-sandstone-mudstone, trachyandesite and alluvium units. Limestones are dark gray coloured, properly medium and thick bedded. The XRD studies show that the rock is entirely composed of calcite mineral. It has been observed in polarizing microscope studies that the calcite minerals are in a microcrystalline structure and ferrous melts locally migrate along fracture-crack planes. XRF analyzes have shown that the rock contains about 55% CaO and some elements such as Na-Fe-Al-Si are present in the rock in small quantities. These carbonate rocks, controlled by faults and karstic structures, offer reservoir rock properties for the thermal waters in the region. The meteoric waters percolate through to these carbonate rocks via by major faults and fractures, then heated with geothermal gradient and ascend to the surfaces as thermal waters.

Key Words: Heybeli, geothermal, reservoir rock, mineralogy and petrography

Biography:

Ahmet Yıldız is a Professor in the Department of Geological Engineering, Engineering Faculty at the Afyon Kocatepe University. He completed his undergraduate and Ph.D. at Suleyman Demirel University. His research interests lie in the area of ore deposits, geochemistry, geothermal and petrography of marble deposits. He is instructor for properties and analyses methods of industrial minerals, exploration techniques of ore deposits and geothermal. He is still the Dean of Engineering Faculty. He is married and has two children.