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CHEMICAL COMPOSITION OF HOT SPRING, IMPLICATION FOR HIGH SULFIDATION MINERALIZATION IN CIJULANG, WEST JAVA, INDONESIA

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ABSTRACT

Several hot springs were observed along the Cikahuripan River of Cijulang High Sulfidation mineralization area in the vicinity of Garut Regency, West Java Province. This study will describe the chemical composition of thermal water that could be related with the mineralization within the region. Seven thermal water were collected and analysis for chemical and isotope compositions. Temperature of thermal water, pH and EC were measured in situ, HCO₃ was analyzed with titration method, and cation, anion and stable isotope were analyzed in laboratory.

The lithology of the Cijulang area is covered mainly by pyroclastic rock volcanic product of Pleistocene age and microdiorite intrusion of Late Miocene age. Structural analysis observed that the distribution of alteration and mineralization within the Cijulang prospect is controlled by lithology and fault NS and NE-SW trends. The alteration is indicated by the occurrences of vuggy silica, pyrophyllite, dickite, kaolinite, illite and smectite-chlorite that classified into four major zonation of prophyllitic, argillic, advanced argillic and massive quartz respectively. .

The mineralization of Cijulang prospect is characterized by massive silica-vuggy quartz texture distributed parallel along the Cikahuripan River. Ore mineral assemblage as observed by megascopic and microscopic analyzed indicated the occurrence of pyrite together with enargite, tetrahedrite-tennantite, galena, stannite, chalcopyrite, and bismuth and molybdenite.

Measured temperature ranges from 60.4 °C to 85.8 °C and pH varies from 4.96 to 8.04. EC ranges from 1.092 ms to 5.89 ms with TDS content varies from 1048 ppm to 2550 ppm. The thermal water composition is divided into Cl and Cl-SO₄ types. The Cl type water is originated from magmatic water that passed vertical flow to the surface through fault along the Cikahuripan this represented by CKH-01 and CKH



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-02. The Cl-SO₄ type is indicated the mixing between CL and SO₄ water at various depth and flow through the sulfate bearing formation or lithology that has high sulfur content. The mixture also probably due to the fluids is flow through alteration formation of argillic and propylitic sequence. However isotope composition of $\delta^2\text{H}$ (‰) ranges from -35,8 to 38,0 and $\delta^{18}\text{O}$ (‰) ranges from -4,69 to -4,85 has indicates geothermal field origin.

This study has shown that the present thermal water could have similar origin with the fossil thermal water that contributed to the mineralization type of the High Sulfidation system at Cijulang area.

Keywords: *Cijulang, Thermal water, High Sulfidation*