

## KARAKTERISTIK DAN PROSES GEOKIMIA FLUIDA DALAM RESERVOIR LAPANGAN PANAS BUMI "WIJAYA" PROVINSI SUMATERA BARAT

### SARI

Lapangan panas bumi "Wijaya" di Provinsi Sumatera Barat yang dikelola oleh PT. Supreme Energy memiliki potensi energi sebesar 60 MW setelah dilakukan eksplorasi pada 6 sumur hingga akhir tahun 2013. Pada Agustus 2019, PT. Supreme Energy menargetkan untuk dapat menghasilkan 80 MW dari total 13 sumur yang dieksploitasi. Sebelum memasuki tahap produksi, upaya pemantauan karakteristik kimia fluida serta pemahaman proses-proses yang terjadi dalam reservoir panas bumi perlu dilakukan. Proses-proses geokimia dalam reservoir ini meliputi proses pendidihan, pendinginan, pencampuran fluida, dan arah aliran fluida di dalam sistem panas bumi. Hal tersebut penting untuk diketahui sebagai data dasar geokimia guna memahami kondisi reservoir panas bumi sebelum masuk ke tahap produksi. Pemahaman proses-proses fluida dan karakteristik kimia dalam reservoir ini dilakukan dengan melakukan analisis data kimia fluida yang diambil pada tahap eksplorasi dan tahap pengembangan melalui analisis geotermometri, diagram trilinear, diagram Schoeller dan analisis model pencampuran. Berdasarkan analisis tersebut diketahui bahwa fluida panas bumi di sumur WJY-1, WJY-2, WJY-3 dan WJY-4 yang terletak pada satu *well pad* memiliki karakteristik kimia dan fisika yang mirip, yaitu termasuk jenis air klorida dengan kandungan klorida rata-rata di atas 1600 mg/kg, pH mendekati 7 dengan suhu air panas bumi sebesar 250-260<sup>0</sup>C, dan reservoirnya termasuk jenis reservoir dua fase dengan kehadiran zona uap di dalamnya. Selain itu juga diketahui bahwa proses geokimia yang terjadi pada sumur WJY-1, WJY-2, WJY-3 dan WJY-4 adalah proses pendidihan dan pencampuran fluida.

**Kata kunci:** lapangan panas bumi, geokimia fluida, karakteristik geokimia fluida, proses geokimia fluida

**GEOCHEMICAL CHARACTERISTICS AND PROCESSES OF RESERVOIR  
FLUIDS IN "WIJAYA" GEOTHERMAL FIELD, WEST SUMATERA  
PROVINCE**

**ABSTRACT**

*"Wijaya" geothermal field in West Sumatera Province which is managed by PT. Supreme Energy has energy potential of 60 MWe after the exploration of 6 wells until the end of 2013. In August 2019, PT. Supreme Energy is targeting to produce 80 MWe from total 13 wells. Before entering the production stage, monitoring the fluid geochemical characteristics and understanding the fluid geochemical processes that occur in geothermal reservoir need to be carried out. Those geochemical processes in the reservoir consist of boiling, cooling, fluid mixing process, and fluid flow direction in the geothermal system. These informations are very essential to know as basic geochemical data in order to understand the condition of geothermal reservoir before entering the production stage. Understanding the fluid processes and the chemical characteristics in the reservoir are carried out by analyzing the fluid chemical data which were taken during the exploration stage and development stage through geothermometry, ternary diagram, Schoeller diagram and mixing model analysis. Based on those analyzes it is known that the geothermal fluid in WJY-1, WJY-2, WJY-3 and WJY-4 wells which are located on one well pad has similar chemical and physical characteristics, i.e. the water is chloride water with average chloride content above 1600 mg/kg, pH approaching 7 with a geothermal water temperature of 250-260 °C, and the reservoir is a two-phase reservoir with the presence of a steam zone in it. In addition, it is also known that the geochemical processes that occur in WJY-1, WJY-2, WJY-3 and WJY-4 wells are boiling and fluid mixing.*

**Keywords:** *geothermal field, fluid geochemistry, fluid geochemical characteristics, fluid geochemical processes*