

Modeling Hydrothermal Fluid Mixing in the Biliran Geothermal Wells

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Abstract

In geothermal systems, mixing of different kind of fluids (geothermal-meteoric, geothermal seawater, etc.) is a common process. Ascending adiabatically boiled geothermal fluids usually interact with cold meteoric recharge waters at the “edge” of the geothermal system. However, mixing may also occur where the water started to boil or even at any given depth. In the case of Biliran, the large difference in the estimated reservoir temperature based on fluid inclusion of wells BN6 and BN7 located a few meters apart along with presence of late stage hematite and goethite suggests that mixing of different fluids may be occurring in the well. In order to understand this change in pH and the effect of mixing different fluids in the Biliran geothermal wells, geochemical modeling was done using CHIM-XPT (2016) and companion programs. Results of modeling different scenarios particularly mixing acidic fluid to neutral fluids showed that the influx of small amount of acidic fluids lead to a decrease in pH and precipitation of some minerals (e.g. anhydrite).