BASIC CHARECTERISTICS AND ORIGIN OF ZHANGZHOU GEOTHERMAL FIELD, FUJIAN PROV., SE CHINA

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Zhangzhou Geothermal Field is the highest in temperature one so far discovered in coastal area of SE China. The highest temperature measured at the well-head exhibits 106°C and 121.5 °C at the bottom of a drillhole of 90 m depth. The flow-rate of an artesian well in the central part of the Field may reach 500 tons per day. The common chemical type of thermal water is Cl-Na type. The highest TDS is 12g/l with the highest Cl content of 6 g/l. The temperature, flow-rate and chemical contents of this Field are, on the whole, quite stable according to observations.

Two sets of faults are obvious in Zhangzhou Geothermal Field, namely they are NNE, NWW and NE, NW respectively. The regional distribution of thermal water is cotrolled by these two fault sets. Chemically, thermal water of the Field is charecterized by the high Cl content which is resulted from the mixing with the sea water. Oxygen and hydrogen isotope studies indicate that thermal water originally comes from the meteoric water. The recharge area seems to be the Tian-bao Mt. in the NW direction of the Field with an elevation of about 800 to 1000 m. The H^3 dating revealed that the "age" of thermal water appears to be more than 30 years. The reservior temperature calculated by SiO_2 geothermo-meter using mixing model is 140°C. The circulation depth of thermal water seems to be 4 km according to the calculation by "Cylinder model".

Convection has been recognized to be the dominant process of heat transfer in the Field. The convective heat flow in the central part of the Field may reach a value of 8.57 HFU, whereas the regional conductive heat flow is 1.75 HFU for the entile Field. The basement rock (granite) of the Field is high in U, Th contents and thus, in addition to the heat from the depth of the Earth, the radiogenic heat from the upper crust may contribute a large amount of heat to the Field.