THERMAL SPRINGS IN THE REPUBLIC OF KOREA

Lim, Jeong Ung, Korea Institute of Energy and Resources, SEOUL KOREA

In the Republic of Korea, there are 24 thermal springs ranging water temperature between 24°C and 78°C and 40 mineral springs. These thermal springs are developed for bathing and resort facilities. Total amount of daily use of thermal water from those springs reaches up to 30,000 cubic meters, resulting the groundwater table lower about 100m below the surface in most cases.

Most of these springs are found in the central part and southeastern part of the peninsula, coinciding with the structural line of NE or NNE direction. The local distributions of the thermal springs are subdivided into three groups according to regional geology. In the central part, the Gyeong-gi massif and the Okcheon Tectonic belt of the Paleozoic are running NNE direction and granite intrusion during the Jurassic is the sole igneous activities, but it is clearly evidenced by the presence of springs parallel to the structural lineament NNE and closely related with the granite intrusion. In the southeastern part, igneous activities and tectonic movement became younger than the central part. The Cretaceous granite is the main host rocks with some Tertiary volcanic outcrops. Thermal springs are densely populated along the fault line of NNE. The heat flow unit in this region ranges higher than 2.0 HFU throughout the country. This is indirectly evidenced by the presence of many springs with relatively high temperature and high dissolved chemical contents.

Water quality of these springs are characterized by alkali rich type but low quantity of dissolved ions. However there is a slight difference in water quality of different region. Springs in the southeastern part shows Na-Cl rich and high dissolved contents, while Na-HCO_3 type in the central part. Thermal gradient averages 2.5°C/100m but increases up to 5.0°C/100m at Pohang within a measurable depth up to 500m, which can be expected to reach the water temperature higher than 100°C at the depth of 2,000m.

All these previous results are the base of future plan to develop the geothermal resources in the Republic of Korea more deeper and more countrywide in the coming few years.