

SVC061-07

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## Results and problem of the tracer test during circulation of HDR/EGS system

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A tracer test is a useful method for determining flow regimes in a geothermal reservoir. In Hot Dry Rock and Enhanced geothermal system (HDR/EGS) test fields, tracer tests have been conducted to estimate reservoir volumes and their changes with circulation conditions at Fenton Hill in USA, Hijiori and Ogachi in Japan, Soultz in Europe etc. Since the spatial expansion of HDR/EGS reservoirs influences the efficiency of heat extraction, tracer response in production fluid gives important information for estimating the volume and lifetime of the HDR/EGS reservoir. I carried out the tracer test at Hijiori site and Habanero site of cooper-basin area in south Australia. These tracer test were designed with two tracers: 1,3,5-naphthalene trisulfonate (1,3,5-NTS) and sodium fluorescein (Uranin). In these tracer tests, the fibre-optic fluorometer was used to obtain real-time and on-site fluorescence counts for sodium fluorescein and was compared with laboratory analysis.

But the effect of the fiber-optic fluorometer depends on site condition. At Hijiori site, high pH and lower temperature, the counts of tracer was high and the tracer response curve was clear. But at Habanero site, low pH and higher temperature, the counts of tracer was low and the tracer curve include many spikes due to the fluorescence light from sodium fluorescein was weak at lower pH and higher temperature.

And 1,3,5-NTS did not decompose at higher temperature, but the wavelength of fluorescence light did not match to optical fiber system.

For future tracer test at HDR/EGS site, I will discuss about the merit and problems about optical fiber method.

Keywords: tracer test, optical fiber, fluorescence, HDR/EGS system, Australia