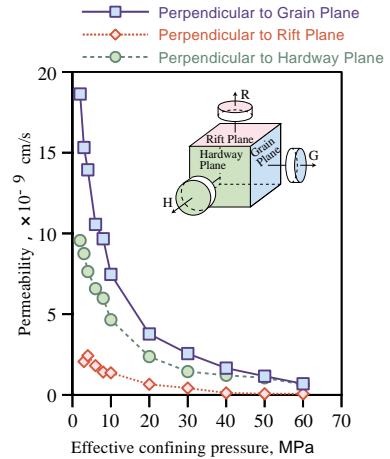


Determination of Hydraulic Properties of Low-Permeability Geologic Materials

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Low-permeability geologic materials are now being scrutinized in increasing detail because of their importance in retarding the transport of hazardous materials that are disposed or stored underground. To determine the permeability both rapidly and accurately in the laboratory, rigorous theoretical analytical method is used to evaluate three laboratory techniques: constant head, constant flow rate, and transient-pulse permeability tests. In addition, a new versatile laboratory system has also been developed. The efficiency and accuracy of these analyses and this new laboratory system are demonstrated through a series of experimental results derived from various types of rock.



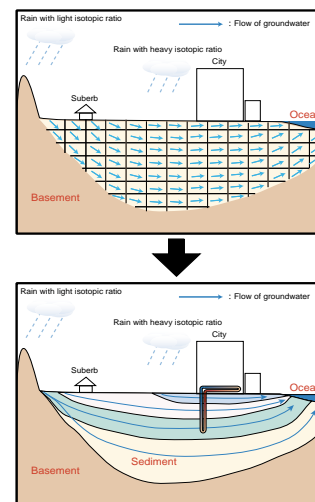
Effects of confining pressure and anisotropy on the permeability of Inada Granite.

Geological Research for Utilization of Low-Temperature Geothermal Resources

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For the low-temperature geothermal utilization such as geothermal heat pumps, understanding of geological and hydrological structures is as important as reduction of the drilling cost in Japan. Underground heat energy is unevenly distributed due to groundwater flow. The objective of our research is to develop a 3D resources assessment technique for low-temperature geothermal utilization. We will develop techniques for analyzing 3D thermal and hydrological structure based on the subsurface temperature distribution, groundwater chemistry, and geology. We will also establish a guideline for utilization of low-temperature geothermal resources based on numerical simulation results. Once the amount of utilizable low-temperature geothermal energy and environmental influence is evaluated through this research, in-

stallation of geothermal heat pumps may be promoted in Japan.



Construct numerical model based on geological and hydrological survey

Estimate utilizable resources and environmental influence based on simulation of low-temperature geothermal utilization

Flow of Research and Development

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