

Multi-directional rock fracturing method

Improved resource extraction rate!

Contribution to CCS!

Overview

Hydraulic fracturing method is widely used in underground resource development to create fractures in the rock by injecting high pressure fluid into a borehole. The direction of fractures created by hydraulic fracturing method is limited to the direction of the maximum principal stress of the formation, so it may not create fractures in the desired resource storage area direction. In this case, several boreholes need to be drilled, but drilling requires high cost. The underground resource storage area is nonuniformly distributed, and the possibility of connecting to the resource storage area by hydraulic fracturing method is not necessarily high.

One of the conventional hydraulic fracturing method is to use a low viscosity fluid to create reticulated microfractures. However, its permeability is significantly small.

This invention is about a hydraulic fracturing method that creates several fractures in the rock, and it is able to create fractures in directions other than the direction of the maximum principal stress of the rock. This invention can considerably improve the probability of creating fractures which reach the resource storage area. In addition, in carbon dioxide capture and storage (CCS), it is expected to increase the amount of carbon dioxide stored.

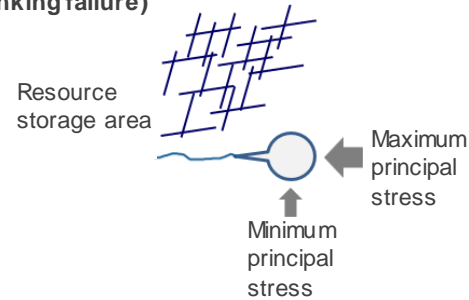
Product Application

- Resource extraction(oil, shale gas, geothermal etc.)
- Carbon dioxide Capture and Storage (CCS)

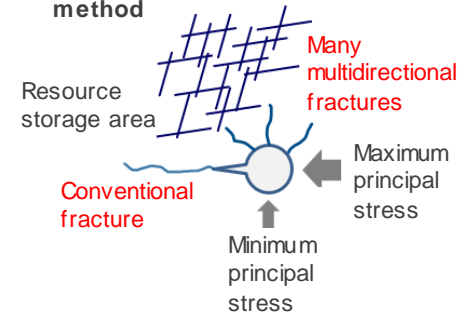
IP Data

IP No. : PCT/JP2023/002701
 Inventor : MUKUHIRA Yusuke, WATANABE Noriaki, GOTO Ryota
 Admin No. : T22-176

Conventional hydraulic fracturing method
(linking failure)



This invention's hydraulic fracturing method

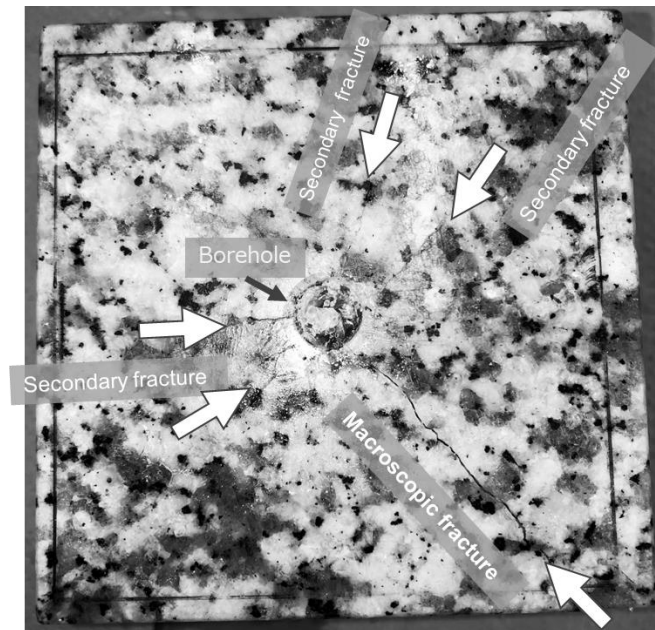


Multidirectional fracture formation with granite

Experimental condition

Axial pressure: 50 MPa

Liquid injection condition : constant flow rate 1 ml/sec
 cf. granite tensile strength: approx. 6 MPa



Contact