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水の減圧沸騰環境下における岩石の破壊現象
Occurrence of rock/mineral fracture under the rapid decompression boiling condition of water

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In our previous water-rock interaction experiments under the various hydrothermal conditions using granite or artificial quartz samples, clear cracks or fractures in the samples were observed under the specific hydrothermal condition. We have named this phenomenon as ”Hydrothermally Derived Fracture (HDF)”. Understanding of this fracturing phenomenon may be useful for technological development of geothermal reservoir usage or clarification of vein formation mechanism in the Earth crust. In our previous experimental results, HDF were progressed under the high temperature and low-pressure condition. The result of detailed observation, it was thought that the thermal stress occurred with rapid cooling of rock/mineral sample surface by condensed vapor dew. Similarly, rapid decompression from the high-temperature/pressure state causes, the temperature drop by latent/sensible heat effect. Therefore, when the such rapid decompression was occurred around the rock/mineral samples, HDF may occur under the hydrothermal condition. And so, we attempted rapid decompression experiment from the over 20 MPa / 400?C hydrothermal condition. As a result, the fracturing in the samples was progressed clearly. Therefore, decompression fracturing is possible and the same phenomenon may arise subsurface of near the volcano or hotter and deeper crust with water.

キーワード: 熱水誘起割れ（HDF）, 岩石熱水相互作用, 急減圧, 花崗岩, 岩石破砕
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