Contribution ID: **480** Type: **Oral 20 Minutes**

Permeability evolution of thermo-mechanically coupled granite

Wednesday, 16 May 2018 10:26 (15 minutes)

Permeability of Luhui granite with 200mm in diameter and 400mm long was measured at triaxial stresses and elevated temperature using 600℃20MN servo-controlled triaxial rock mechanics testing machine. It is found that 300℃ is the threshold temperature (Tc) of permeability change with temperature in thermally cracked granite. The magnitude of permeability is 10-7D with a low increase below Tc and the permeability whose magnitude is 10-6D increases drastically with high amplitude at 300℃-400℃ while the magnitude is 10-5D at 400℃. Simultaneously, the change of micro-crack quantity in thermally cracked Luhui granite at temperature up to 400℃ was quantificationally investigated by MPV micro-photometer. Two peaks of micro-crack quantity that the length is more than 5μm and 10μm respectively exist at temperature up to 400℃. The temperature scope where micro-crack quantity peak appears in length>5μm is less than that in length>10μm. The quantity of micro-crack whose length is more than 10μm increases sharply at the rate of one per ten centigrade at temperature above 300℃. The drastic increase of micro crack above 300℃ is the main reason that permeability increases sharply at temperature above 300℃ in thermally cracked granite. Compared with preheated results, thermal and mechanical coupled effect can more heavily affect granite permeability than only thermal effect.

References

Acceptance of Terms and Conditions

Click here to agree

Primary authors: Dr FENG, Zijun; Prof. ZHAO, Yangsheng

Presenter: Dr FENG, Zijun

Session Classification: Parallel 6-F

Track Classification: MS 4.22: Evolving porous media and coupled chemical and physical processes