Contribution ID: **510** Type: **Poster**

Neutron –TOF –diffraction study of intracrystalline residual strain at samples from the Mongolia

In this study, we investigated two samples; a granite and a sandstone sample, from the Mongol-Altai Mountains. The Southern Mongolia's territories are impacted to be a powerful tectonics and are still considered to be active seismic zones [1]. The extracted samples experienced a strong deformation on this location. The aim of the study is the investigation of residual lattice strains in the samples using neutron time-of-flight diffraction. Neutron diffraction is a powerful tool for the study of the residual stress behavior in bulk materials, like geological samples containing large grains [2]. The changes of the crystal lattice distances result in a shift of the characteristic Bragg reflection lines. This can be measured with high resolution by neutron time-of-flight diffraction techniques. Because of the high penetration depth of neutrons in matter, this method allows the strain investigation of polycrystalline bulk materials [3], [4].
Using this study we determined the residual strain in two rock types by neutron time-of-flight diffraction at the stress/strain diffractometer EPSILON at the pulsed neutron source IBR-2M.
A phase analysis of the granite and sandstone samples has been done by X-ray diffraction pattern. The content of the granite was determined as silicon dioxide (quartz –SiO2), sodium aluminum silicate (albite –NaAlSi3O8), potassium aluminum silicate (microcline –KAlSi3O8), potassium aluminum silicate hydroxide (illite 2 –(KH3O)Al2Si3AlO10(OH)2). The sandstone is contained silicon dioxide (quartz –SiO2), iron magnesium aluminum silicate hydroxide (clinochlore 1 –(Mg,Fe)6(Si,Al)4O10(OH)8), potassium aluminum silicate hydroxide (illite 2 –(K,H3O)Al2Si3AlO10(OH)2), sodium calcium aluminum silicate (anorthite –(Na0.45Ca0.55)(Al10.55Si2.45O8)) from XRD diffraction pattern data.

References

[1]. Genyao, W. (2013) J. Palaeogeography 2 (3), 306-317. [DOI: 10.3724/SP.J.1261.2013.00033]
[2]. Scheffzük, Ch., Hempel, H., Frischbutter, A., Walther, K., & Schilling, F.R. (2012) J. Phys. Conf. Ser. 340, 012038.
[3]. Scheffzük, Ch., Walther, K., and Frischbutter, A. (2014) Materials Science Forum 777, 136-141.
[4]. Badmaarag, A., Scheffzük, Ch., and Sangaa D. (2016), Mongolian Journal of Physics 2, 442-448.

Primary author: Mr ALTANGEREL, Badmaarag (Mongolia)

Presenter: Mr ALTANGEREL, Badmaarag (Mongolia)

Track Classification: Applied Research