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Oral | Symbol S (Solid Earth Sciences) | S-CG Complex & General

## [S-CG61\_2AM2] Petrology, Mineralogy and Resource Geology

Convener: \*Toshiaki Tsunogae (Faculty of Life and Environmental Sciences (Earth Evolution Sciences), University of Tsukuba), Koichiro Fujinaga (Department of Systems Innovation, School of Engineering, University of Tokyo), Akira Miyake (Department of Geology and Mineralogy, Graduate School of Science, Kyoto University), Nobutaka Tsuchiya (Department of Geology, Faculty of Education, Iwate University),  
 Chair: Koichiro Fujinaga (Department of Systems Innovation, School of Engineering, University of Tokyo), Akira Miyake (Department of Geology and Mineralogy, Graduate School of Science, Kyoto University)  
 Fri. May 2, 2014 11:00 AM - 12:45 PM 311 (3F)

We widely invite presentations in the fields of petrology, mineralogy and resource geology. Especially description of minerals and rocks, investigation of their origin and evolution by field investigation and/or laboratory experiments, and development of new methods are accepted.

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12:15 PM - 12:30 PM

## [SCG61-P17\_PG] Dependence of water concentration distribution of columnar joints formation in analogue experiments

3-min talk in an oral session

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Keywords: columnar joint, analogue experiment, crack formation, Micro-focus X-ray CT, concentration distribution

Columnar joints of igneous rocks and ignimbrites have various morphological patterns. As their unit structure, column structure can be classified in terms of straight or curved. Columnar joint is formed by volume contraction due to cooling and tensile stress accumulated inner the volume is released as sequentially cracks according to the temperature gradient during cooling. Basic research to explain how curved columns are formed has not been conducted. In this study, we report the results of reproducing curved structure in analogue experiments by drying starch and water mixture. We put the mixture into a cylindrical container and light a lamp (60W) 1.5cm above the surface of mixture. We take images with X-ray CT of the specimen before drying perfectly and observe the spatial distribution of water concentration of the mixture on the way to form columnar joints. As a result, we recognize that water concentration distribution at a depth in mixture increases with the horizontal distance from just below the lamp. The direction of crack developing from the surface of the mixture to inner is almost perpendicular to the contour of water concentration. We confirm that the effect of heat from the lamp on the surface of the mixture differs with the distance from the lamp and it suggests inhomogeneous water concentration in mixture is caused by the difference of drying rate depending on the distance from the lamp. We also report the relationship between the direction of crack advance and the change of water concentration distribution with time.