

## Granite-related gold mineralization — FIP study of Wulong gold deposit and Sanguliu granite, southern Liaoning province, NE China

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### Introduction

Wulong gold deposit, located in southern Liaoning province, NE China, is a large-scale gold deposit, which related to Sanguliu Mesozoic granite (Yanshanian period). The gold mineralization occurred mainly as auriferous quartz veins in the country rocks (Proterozoic metamorphosed rocks) close to the granite, and was controlled by three groups of fractures: NW, NE and NNW trend fractures. There is also some less important gold mineralization within the granitic intrusions.

### Fluid inclusion plane (FIP) preferred orientation

(1)The preferred FIP orientation of Wulong auriferous quartz veins is E-W trend; (2)The preferred FIP orientation of Sanguliu granite is E-W trend

### Fluid inclusion petrography and microthermometry

(1)Three fluid inclusion types in Wulong auriferous quartz veins and Sanguliu granite can be recognized, which are gas-rich fluid inclusions, liquid-rich inclusions and fluid inclusions with variable vapor/liquid ratios.

(2) The fluid immiscibility in Wulong auriferous quartz veins and Sanguliu granite were indicated by co-existence of vapor- and liquid-rich fluid inclusions.

### Conclusions

(1)The rock-forming fluid of Sanguliu granite and the ore-forming fluid of Wulong auriferous quartz veins are all trapped under the same regional stress field;

(2)The trapping time for rock-forming fluid from Sanguliu granite is the same as the trapping time of ore-forming fluid from the auriferous quartzs in Wulong gold deposit

(3)The fluid inclusion characteristics in FIP of Sanguliu granite are similar to that in the Wulong auriferous quartz veins, which can be related to the same Mesozoic tectonic-magmatic activity in southern Liaoning province, NE China.

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## The Tono Natural Analogue Project: Uranium migration in sedimentary rocks, the Tono uranium deposit, Japan

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Uranium (U) -series disequilibrium study to estimate U migration/preservation processes is currently as a part of the Tono Natural Analogue Project at the Tsukiyoshi orebody, Tono, Gifu Japan. Particular emphasis has been focused upon processes responsible for preservation and confinement of the orebody over a timescale of  $\sim 10^7$  years. The orebody exists in the Tertiary sedimentary rocks along the paleochannel of the basement Cretaceous granite. The orebody is inferred to have been formed by groundwater flow including U along paleochannel prior to 10 Ma. Previous studies have revealed that there has been negligible vertical migration of U on a  $10^7$  year timescale, but that there has been some lateral migration. Differences in the systematic of U-series disequilibria at different locations have suggested that different deposition/removal processes are operating at different positions along the groundwater flowpath, but the extent of lateral migration of the U-series nuclides is poorly constrained.

This paper reports the results of a study of U-series isotope systematic in rock samples from three locations that are distinguished mainly by their position relative to the groundwater flowpath in the Tsukiyoshi orebody: upstream (*i.e.*, located approximately in the geographic center of the orebody), midstream and downstream (near the orebody's downstream boundary). The samples are otherwise similar with respect to rock type (fine to medium-grained sandstone), distance from the top of the basal conglomerate (ca.1-4m) and thickness of the basal conglomerate (ca.9-15m).

$^{234}\text{U}/^{238}\text{U}$  and  $^{230}\text{Th}/^{238}\text{U}$  activity ratios at the upstream location vary between 1.01 – 1.00 and 1.04 – 1.05, respectively, indicating removal of U. At the midstream location,  $^{234}\text{U}/^{238}\text{U}$  and  $^{230}\text{Th}/^{238}\text{U}$  activity ratios are close to unity, indicating that U has remained in place at this location during the past  $10^6$  years. At the downstream location,  $^{234}\text{U}/^{238}\text{U}$  and  $^{230}\text{Th}/^{238}\text{U}$  activity ratios are 0.92 and 1.27, respectively, indicating that removal of U has occurred at this location within the last  $10^6$  years. Then, for close to the top of the basal conglomerate, it may be presumed that uranium has been subject to partial lateral migration at the upstream and downstream locations in the past one million years. This study is at a preliminary stage and will be extended by additional natural decay series analyses and U-Pb dating of rock and mineral samples from various locations in the Tsukiyoshi orebody.