Soil water movement traced by oxygen isotope in the Mu Us sandy land, North China

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Soil water is very important to plant growth because of arid climate in the Mu Us sandy land. However, knowledge on soil water movement of this region is little till now. In this study, oxygen isotope compositions of soil water in the dune profiles at Henan Village are investigated and then soil water movement is explored.

Two dune profiles with the depth of 3.75m are bored at a about 12 h interval before and after a thunderstorm in the same site at Henan where average annual precipitation is about 400mm but average annual evaporation is up to 2000mm [1]. Soil water is extracted from samples after they are sent to the laboratory by the vacuum-distillation apparatus and then is analyzed for $\delta^{18}O$ via MAT253.

$\delta^{18}O$ value of soil water changes greatly between -0.96 and -7 in the upper part with the depth of about 1.8m but fluctuates constantly within a narrow range of -6 ~ -8 in the lower part of the first profile (before thunderstorm). $\delta^{18}O$ value of soil water also has a large variation from -2.87 to -7.54 in the upper part and a similarly narrow range in the lower of the second profile (after thunderstorm). The isotopic data have three implications: (1) the evaporation only impact water isotope in the upper profile with the 1.8m depth; (2) the thunderstorm event carries more negative oxygen isotopic composition into the upper profile; (3) since soil water in the lower profiles has $\delta^{18}O$ value more positive than that of local groundwater [2], they seem not to be of same origin. In addition, the average infiltration rate of this precipitation is about 15cm per hour through calculation.

As a result, the precipitation infitration is only limited to the 1.8m depth under the land surface although there is a large amount of the precipitation for the thunderstorm event in a short time. It is thus inferred that vertical infiltration of the precipitation through the dunes might have little recharge to groundwater.

[1] Yang Yuncheng *et al*. (2005) *Acta Geoscientica Sinica* **26**, 289–292. [2] Hou Guangcai *et al*. (2007) *Journal of Jilin University (Earth Science Edition)* **37**, 255–260.

Geochronology of continental volcanic-type gold mineralization in East Tianshan, Western China: Constraints from Ar-Ar isotope of Shiyingtan gold deposit

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The East Tianshan area in northwest China locates on the boundary between Tarim plate and Kazakhstan-Junggar plate. Both plates had experienced a complicated breakup and collision since late Precambrian, accompanied by large-scale thrust and continental volcanism [1]. Previous studies suggested two stages of continental volcanism: the first stage occurred between Late Carboniferous and Early Permian with isotopic age of 310~290Ma; the second stage occurred between Late Permian and Early Triassic with isotopic age of 260~240Ma. The Shiyingtan gold deposit locates in the extensional tectonic-magmatic belt of Queleage in East Tianshan area, composing mainly of NO.I, NO.II, NO.III ore bodies, with ores held by both gold-bearing quartz veins and altered andesite. Andesite, hornblende andesitic dacite, amygdaloidal andesite, volcanic breccia agglomerate lava and volcanic breccia of Permian are the exposed strata within mined area.

In order to study the metallogenic epoch of Shiyingtan gold deposit, altered andesite ores were sampled from NO.I ore body, from which sericite is extracted for ^{40}Ar-^{39}Ar isotope dating analysis by step-heating, yielding a plateau age (Tp) of 304.2±1.3Ma and isochron age (Ti) of 304.7±4.9Ma (initial ratio of $^{40}Ar/^{36}Ar$=292±10). This mineralization age of 304Ma in Shiyingtan gold deposit is in great concordance with the age of ore-bearing volcanic rocks, deposition of gold occurred in extensional tectonic stage of post-orogenic between late Carboniferous Kazakhstan-Junggar and Tarim plates, developing in the extensional area of shear flank.

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[1] Li *et al*. (2004) *Geological Publishing House*.