Extraction time for soil water of desert sand used in stable isotope analysis

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Vacuum distillation has been widely used to extract soil water for stable isotopic analysis in studies of water cycle Distillation time is very crucial to complete soil water extraction. In this study, experiments of extracting water from dune sand of the Chinese desert are carried out to determine optimal extraction time.

Seven 30g sand samples with 10% moisture and known water isotopes are prepared and the distillation temperature is set at 105°C for the experiments of soil water extraction. The samples are vacuum-distilled for 4min, 8min, 12min, 16min, 20min, 25min and 30min, respectively (Fig. 1). Extracted water is analyzed for δ^2H and $\delta^{18}O$ by MAT253.

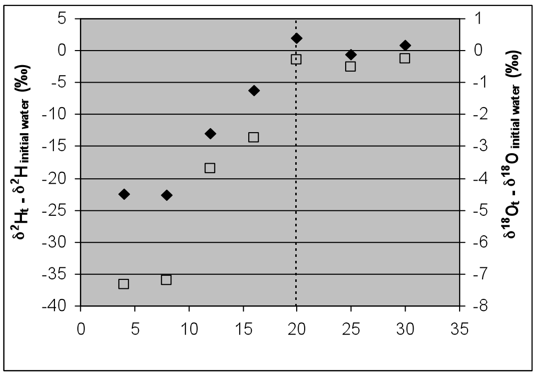

Figure 1: Isotopic variation of water extracted from sand samples.

As shown Fig.1, δ^2H_t-$\delta^2H_{initial}$ and $\delta^{18}O_t$-$\delta^{18}O_{initial}$ gradually increase with time. They arrive to zero (‰) at 20min and then tend to be constant. This result indicates it need take at least 20min to completely extract soil water from desert sands. For different types of soils, the extraction time is distinct [1]. To be on the safe side, we suggest 28min for extracting water from sands in the Chinese deserts. Certainly, water extraction of over 30min is insignificant. Our conclusion agree well with West *et al*. (2006) [2].

[1] Landon *et al*.(1999) *Journal of Hydrology* **224**, 45–54.
[2] West *et al*. (2006) *Rapid Commun. Mass Spectrom* **20**, 1317–1321.

Episodic events of the Western North China Craton and North Qinling Orogenic Belt, in central China: Revealing by detrital zircon U–Pb ages

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Detrital zircon U-Pb geochronology serves as a proxy to study of crustal evolution and provenance discrimination. In order to unravel episodic events and their tectonic relationship of the North China Craton (NCC) and North Qinling Orogenic Belt (NQOB), detrital zircons from modern river sands and metasedimentary rocks are collected and dated by LA-ICPMS. Although the western NCC (Ordos terrane) is covered by Mesozoic-Cenozoic basin sediments, the U-Pb dating results have shown that the age populations of detrital zircons from the western NCC with prominent U–Pb age peaks at 2475 Ma and 1850 Ma, which indicates the western NCC (Ordos terrane) also has early Precambrian basement similar to the eastern and central craton. In addition, a significant number of early Paleozoic (520-400 Ma) zircons have bee found in the western NCC, which is quiet different from the eastern NCC and is considered to be related to the collision between the NQOB and the NCC.

The age spectra of detrital zircons from the NQOB presents a complex age pattern, which reveals four major age groups of Neoarchean (2.6–2.4 Ga), Neoproterozoic (1.0–0.85 Ga), early-middle Paleozoic (450-350 Ma) and early Mesozoic (250–170 Ma). As indicated by the U-Pb isotopic data that the NQOB could be an independent terrane at least prior to the Neoproterozoic and once a portion of the Grenville orogenic belt during the 1.2-0.8 Ga with a peak of ~1.0 Ga. In other words, the NQOB has its unique geological evolution history obviously different from those of the NCC and the Yangtze Craton. The complete collision between the NQOB and the NCC perhaps took place at Paleozoic (450-400 Ma).