

## Isotope Compositions of Modern Precipitation in the Ordos Desert Area, China

JIN KE\*, RAO WENBO AND SUN JIANG

School of Earth Sciences and Engineering, Hohai University, Nanjing, 210098, China

(\*correspondence: jin55669987@163.com)

The precipitation is a main source of groundwater recharge, which is of important significance for the ecological environment in the arid and semi-arid region. The Ordos Desert is one representative of the (semi-)arid areas, North China. However, knowledge on the provenance of precipitation in this area is little till now. In this study, rainwater samples were collected from four meteorological stations in the Ordos Desert for one hydrological year from 2010 to 2011 and analyzed for isotopic compositions of  $\delta D$ - $\delta^{18}O$ .

Authors proposed different local precipitation lines for the Ordos Basin based on the data from the IAEA stations surrounding the Ordos Desert. However, their studies can not characterize the Ordos Desert correctly. Using our data, in combination with precious data of the precipitation in the Ordos Desert [1], the latest local precipitation line equation is established:  $\delta D=7.00\delta^{18}O-3.02$  ( $n=118$ ,  $R^2=0.93$ ). Compared with the global precipitation line, which is defined as  $\delta D=8\delta^{18}O+10$  [2], the slope of the local precipitation line is lower, implying that atmosphere precipitation of the Ordos Desert area experienced a certain evaporation.  $\delta^{18}O$  and  $\delta D$  isotopic compositions of the precipitation vary significantly from -10.68 to -3.58 and from -81.21 to -23.08, respectively in summer whereas from -22.19 to -9.61 and from -169.82 to -94.41, respectively in winter. Seasonal variation in isotopic composition of the precipitation was associated mainly with rainfall amount, air temperature and moisture source.

Further, we find that the winter precipitation of the Ordos Desert is isotopically similar to that of the Xinjiang area whereas the summer precipitation of the Ordos Desert approaches that of southern China. This result suggests that atmospheric moisture over the Ordos Desert came from the Siberia in winter but from the Pacific Ocean in summer. The HYSPLIT model also demonstrates this point [3].

[1]Yin lihe et al. (2011) Hydrogeology Journal, 19(2), 429-443  
[2] Craig H. (1961) Science 133, 1702-1703 [3] Air Resources Laboratory. <http://ready.arl.noaa.gov/hypub-bin/trajtype.pl?>