Distribution of biomarks of lacustrine sediments in Linxia Basin and their climate significance

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Present use of fossil molecules to reconstruct paleoclimate and ancient human activities has become an important part of molecular stratigraphy. Fossil Molecules have the characteristics of stable compounds, long-time preservation and wide distribution, providing great information on climatic and environmental changes, provenience of parent materials, redox degree of organic matters, development status of bacteria and microorganisms in ancient environments, different ecology and vegetation systems, past water salinity, and thermal evolution degree of organic matter.

It is useful to enlarge the deep and scope in studying environmental change by the study for change of biomarkers proxies in lacustrine layer. Abundant lipids were recognized in the lacustrine sediments of Maogou section in the Linxia Basin, including n-alkanes, isoprene and n-alkenones. The ratios of nC_{27}/nC_{31} of n-alkanes and the predominance of main peaks of n-alkan-2-one indicate warm-humid climate in miocene (24.6-11Ma). The predominance of main peaks of n-alkan-2-one and the relative abundance of isoprene evidently record the drop of temperature with passage of time in 13Ma. All of climate indexes reflect the occur of dry climate in 8Ma. The ratios of $(nC_{17}- nC_{21})/(nC_{27}- nC_{31})$, nC_{27}/nC_{31} of n-alkanes and the predominance of main peaks of n-alkan-2-one indicate a passage of warm-humid climate after 8Ma. All these researches of climate in research region record commonly the climate respond of global climate change and uplift of the Tibetan Plateau, which are similar to the process of climate change with the study of inorganic proxies. These researches show that molecular fossils should be significant in the study of environment conditions of lacustrine sediments.The parameters and indexes of molecular fossils in the Linxia Basin indicate the change of dry environment.

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Cathodoluminescence and Raman Spectroscopic studies of zircon from the Precambrian–Cambrian boundary in China and its age significance

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Introdution

A total of 85 CL micrographs were obtained from CL imaging at the Peking University. The Raman Spectroscopic analyses for the zircons were determined from Nanjing University. While these characteristic Raman peaks of abnormal zircons were disappeared or very weak, they didn't show relevant relationship with incidence angle as that of normal zircons [1]. It can be thought that the Raman characteristic of the abnormal zircons germanely relevant to its crystal structures and the degree of metamictization.

Discussion of Results

The 21 data from these zircons, lying on or near the concordia curve in the Concordia plot, have the relatively low concentration of U ranging from 192ppm to 421ppm, the ratio of Th/U varying from 0.48 to 0.60 (within the area of typical igneous zircons), better linear relationship between U and Th, CL micrographs with relatively better crystal form and the clearer though not developmental rings, and normal Raman spectroscopic characteristics with characteristic peak at the wavenumber E_q and A_{lg}, intensity of Raman spectroscope ranging from 250 to 1200, and E_g/A_{lg} varying between 1:0.1 and 1:0.7. These characteristics indicated that these dated zircons resulted from the crystallization, and were the best suitable to determine the crystalline age of the bentonites.

Conclusions

As a result of better preservation, the higher crystallization, high-precious data and low error of the sample M5-2, we proposed the U-Pb zircon age of M5-2 (541.3±1.3(σ)Ma, 13 data) to represent the time of volcanism, i.e. the crystalline age of bentonites.

[1] Wang Yinxi *et al*. (2007) *Geological Review* **53**(1), 22-30.