The characteristics of mantle peridotite xenoliths in the Cenozoic volcanic rocks from southeastern China and implication for deep processes in the upper mantle

ZHAO HAILING[1]*, YAOLING NIU[2], FRED. A. FREY[3], DI YONGJUN[1], FANG NIANQIAO[1] AND ZHU FENG[1]

[1]State Key Laboratory of Geological Processes and Mineral Resources, China University of Geosciences, Beijing 100083, China (*correspondence: hlzhao@cugb.edu.cn)
[2]Department of Earth Sciences Durham University, Durham, DH1 3LE, UK
[3]Massachusetts Institute of Technology, Cambridge, MA02139, USA

There are lots of differences in petrology, mineralogy, trace elements and Sr-Nd isotopic composition among peridotite xenoliths from the Cenozoic basalts in the Southeast China. The peridotite xenoliths in volcanic rocks (34.3±1.0Ma) [1] from Puning and those in volcanic rocks (2.2~0.9Ma) [2] from Mingxi are similar to the Kaapvaal Archean peridotite and to the abyssal peridotite, respectively, in content of orthopyroxene.

The characteristics of petrology, trace elements and Sr-Nd isotopic composition of the peridotite xenoliths in Puning provide evidences that the formerly depleted peridotite had probably been metasomatized by H_2O-bearing and SiO_2-rich fluids, produced by the subduction of oceanic plate[3]. Continental lithospheric mantle predating 34.3±1.0Ma may have undergone an enrichment process caused by the subduction in the Mesozoic. Thus the continental lithospheric mantle has the characteristics of both Archean lithospheric mantle and the mantle influenced by Pacific Oceanic plate subduction, implying the interaction between the oceanic lithosphere and the continental lithospheric mantle.

The peridotite xenoliths from Mingxi are enriched in LREE but more depleted in Sr-Nd isotopic composition. So the peridotite xenoliths in the Mingxi volcanic rocks may represent the lithospheric mantle influenced by the asthenospheric upwelling, that is, the lithospheric mantle might be reacted by SiO_2-poor fluids from deep mantle. It is therefore suggested that there was an intereaction between the mantle peritotites and fluids related to the asthenospheric upwelling.

[1] Juang *et al*. (1999) *Bulletin of the Central Geological Survey*, **12**, 147-200.[2] Ho *et al*. (2003) *Chemical Geology*, **197** 287-318. [3] Eller J.M. *et al*. (1998.) *Nature*, **393** 777-781.

Difference evolution of the clay minerals of the three Paleogene depressions in Bohai Bay Basin, China, and its conditionality

M. ZHAO[1]*, X.M. CHEN[1], J.F. JI[1], C.Z. WU[1], Z.Y. CHEN[2], X.D. CHUI[2] AND Y.S. WANG[2]

[1]State Key Laboratory for Mineral Deposits Research, School of Earth Sciences and Engineering, Nanjing University, Nanjing 210093, China (*correspondence: zming412@nju.edu.cn)
[2]Exploration & Development Institute of Liaohe Oil field, Panjing, 124010, China

The authors collected samples systematically from different depths of the strata in the Jiyang Depression, the Changwei Depression and the Damintun Depression, which belong to Bohai Bay Basin. The phase and the chemical composition of the extracted clay minerals(<2μm) from the samples were analyzed on the X-ray Diffraction Machine and the Electronic Probe Instrument. The study results are as follows: (1) During the Paleogene, the buried depth was the largest in the Jiyang Depression, which produced the best evolution of the clay minerals. The buried depth of the Damintun Depression was the smallest, which produced the weakest evolution of the clay minerals. The buried depth and the evolution extent of the clay minerals in the Changwei Depression were both between those of the other two. (2) With the clay mineral geothermometry, the paleogeothermal gradients of the Paleogene depressions were calculated. The average paleogeothermal gradients were 38.3°C/km, 39°C/km, and 35°C/km in the Jiyang Depression, the Changwei Depression and the Damintun Depression, respectively. (3) Analysis of the regional geology shows the sedimentation rates in the Jiyang Depression and the Changwei Depression during the Paleogene were larger than that in the Damintun Depression. So the Paleogene strata in the Jiyang Depression and the Changwei Depression were obviously thicker than that in the Damintun Depression. Caused by the subsequent action of the dextral shear stress to the Jiyang Depression, the buried depth in the area was increeased. But this shear stress had less influence to the Changwei Depression. Therefore, the difference evolution of the clay minerals related to the structural actions and the sedimentation rates in Bohai Bay Basin.