

The Re-Os systematics of the Raobazhai peridotites, Dabieshan, central China

L. ZHENG^{1,2}, X. ZHI¹, AND L. REISBERG²

¹ CAS Key Lab of Mantle-Crust and Environment and School of Earth and Space Sciences, USTC, Hefei, 230026, China; lzheng3@mail.ustc.edu.cn; xczhi@ustc.edu.cn

² CRPG-CNRS UPR 2300, BP 20, 54501 Vandoeuvre-les-Nancy, France; reisberg@crpg.cnrs-nancy.fr

Precise age data for sub-continental lithospheric samples is essential for understanding the stability of continental roots and mass exchange between the crust and mantle. The Re-Os isotopic system has been used successfully to date ultramafic xenoliths and orogenic peridotites, which are thought to represent the underlying lithospheric mantle. However, several recent studies [1,2] reveal that slab-derived fluids can introduce radiogenic Os into the overlying mantle wedge and thus change the Os composition of peridotite xenoliths from the wedge. Thus, the Re-Os system may be disturbed and provide false age information.

Here we present Re-Os results from the Raobazhai ultramafic massif of Dabieshan, China. This massif is thought to be part of the mantle wedge overlying the subducted slab during the Mesozoic Yangtze - North China block collision, which was forced to the surface during subsequent slab exhumation [3]. Os and Re concentrations range from 1 to 5 ppb and from 5 to 430 ppt, respectively. All 15 samples have sub-chondritic $^{187}\text{Os}/^{188}\text{Os}$ values (0.11568 to 0.12830). Despite extensive petrographic and geochemical evidence for several stages of water-rock reaction, involving different fluids, there is no obvious evidence for introduction of radiogenic Os to the massif. Re also shows less mobility than expected, with 13 of the 15 samples studied yielding a rough isochron ($R^2=0.8886$). An age of 1.7 Ga is obtained, consistent with Paleoproterozoic ages of the North-China Craton [4]. Thus while perturbation of the Re-Os system by subduction related fluids is sometimes an important process, it is apparently not a ubiquitous phenomenon.

This study was supported by CNRS grant (No. 40473008).

References

- [1] Widom E., Kepezhinskas P., and Defant., M (2003) *Chem. Geol.* **196**, 283-306.
- [2] Brandon A.D., Creaser R.A., Shirey S.B., and Carlson R.W. (1996) *Science* **272**, 861-864.
- [3] Zhang Q., Ma B.L., et al. (1995) *Chinese Science(B)* **35(8)**, 867-873.
- [4] Gao S., Rudnick R.L., Carlson R.W., et al. (2002) *EPSL* **198**, 307-322.