# Fission track dating of authigenic quartz from the red residua overlying carbonate rock in Guizhou, China

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The dating of weathering curst have been documented by few authors. But, it is generally difficult to select suitable minerals for dating in many profiles. Fortunately, many authigenic quartzs are found in several red residua overlying carbonate rock in Guizhou, China. The aim of this paper is to present the data of fission track dating of authigenic quartz in these weathering profiles.

Three samples of the PB and XP profiles were taken from the bottom to upper respectively. two samples in the upper of HB and HC profiles were collected too, which the sample of HB profile was divided into two by its size. The data show quartz FT ages range from 25Ma to 1Ma, more younger than parent rock (T) (Fig.1). The thermal and tectonic history of Guizhou reveals that no heating event occurred during Cenozoic, which its temperature surpassed the annealing temperature of quartz (900-1000°C). The characteristics of

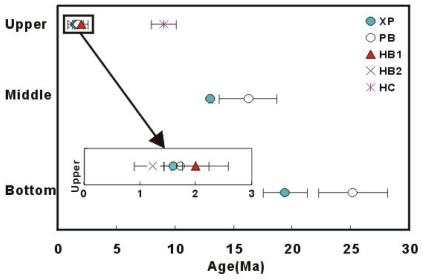


Fig. 1. Authigenic quartz FT ages of four profiles

track length (3-5μm) and track shape confirm further all samples are not annealed. So, the FT ages of authigenic quartz appear to reflect the age of formationc. In other words, the age of the weathering curst would be outlined if the genesiss can be known exactly, presuming formed either in bedrock or lower soil layer of profile. It is also very interesting to point out, from bottom to upper, the FT age of authigenic quartzs decrease gradually, just the opposite of weathering trend. The reason of this phenomenon need to be studied in detail.

**Acknowledgments**

This project was jointly supported by National Natural Science Foundation of China (Grant No. 49833002, 40273015) and the " Western Light " Program sponsored by Chinese Academy of Sciences.

# Formation of the Nb/Ta deficit in the continental crust: Insights with the Precambrian mantle-derived volcanics from North China craton

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A mass imbalance exists in Earth for Nb, Ta and possibly Ti: estimated bulk continental crust (BCC) and depleted mantle (DM) both have subchondritic Nb/Ta, Nb/La and Ti/Zr [1]. Mafic volcanics from the North China craton geochemically show an Archean-Proterozoic (A-P) boundary [2]. The Archean mafic volcanics (AMV) have average Nb/Ta = 20.0, Zr/Hf = 39.1 (Fig. 1a), which could be a potential silicate reservoir to complement the low Nb/Ta (and possibly Zr/Hf) of BCC and DM. However, Nb (and Zr) strongly fractionated from Ta (and Hf) with average Nb/Ta = 7.5 and Zr/Hf = 31.6 for the Proterozoic mafic volcanics (PMV). Given the fine correlation of Ti and Ca with HFSEs and Nb/Ta, Zr/Hf ratios in a large range, the highly fractionations of Nb from Ta and Zr from Hf for PMV could be related to the involvements of Ca-Ti-bearing phases during the mantle melting.

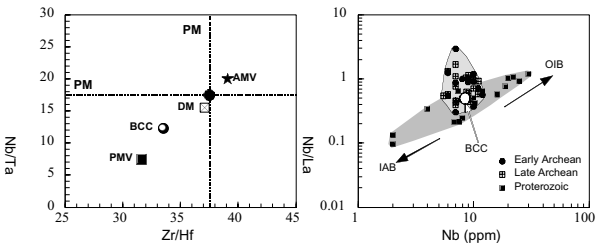


Fig. 1 (a) Average Nb/Ta vs. Zr/Hf for AMV and PMV. BCC is from http://www.earthref.org/GERM. (b) Nb/La-Nb variations of AMV and PMV.

Fig. 1b shows that Nb/La positively correlated with Nb ranging from OIB to IAB for PMV while no obvious correlation is found for AMV, which suggest that large-scale subduction could not have occurred until Paleoproterozoic time in the North China craton. The Proterozoic subduction could have largely contributed to the formation of Ca-Ti-bearing phases and subsequent totally Nb/Ta (and possibly Zr/Hf) deficit of PMV.

**References**

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