# The lithium isotope composition of the Lizhuang complex, Sichuan

SU AINA[1,2], TIAN SHIHONG[2,3], HOU ZENGQIAN[4], LI ZHENZHEN[2,5] AND YANG ZHUSEN[2]

[1]East China Institute of Technology, Fuzhou 344000, P.R. China (aina.su@163.com)
[2]Institute of Mineral Resources, CAGS, Beijing 100037, P.R. China (s.h.tian@163.com)
[3]Key Laboratory of Metallogeny and Mineral Assessment, MLR, Beijing 100037, P.R. China
[4]Institute of Geology, CAGS, Beijing 100037, P.R. China
[5]Kunming University of Science and Technology, Kunming 650093, P.R. China

The Lizhuang complex, which consists of carbonatite sills/dykes in a contemporaneous NNW-striking syenitic stock, is situated in the eastern Indo-Asian collision zone along the western margin of the Yangtze craton (South China). The Lizhuang complex intruded a Mesozoic granite intrusion and an overlying 1000-m thick sequence of Silurian-Triassic carbonate and sandy-mudstone. The least-altered carbonatite is yellow-brown and fine-grained, and consists of calcite (>80%) and minor arfvedsonite, aegirine, aegirine-augite, and biotite. Overlapping emplacement ages, Sr-Nd isotopic compositions and mantle-normalized trace element patterns, which are similar to those of the spatially associated syenites, suggest that the carbonatites formed as a result of liquid immiscibility.

Two samples of brown carbonatites contain 11 and 42 ppm Li and have $\delta^7$Li values of +2.3 and +4.4. These Li isotope compositions overlap with those reported for MORB and OIB, suggesting that the carbonatites reflect the Li isotopic composition of their mantle source. However, two samples of feldspars in syenite contain lower Li values of 0.3 and 1.3 ppm and have higher $\delta^7$Li values of +14.1 and +14.3, which suggest that Li in the syenite was incorporated from an altered oceanic crust.

This work was supported by grants (Contracts No. K0802, 12120108160, 40973013, 40603012, 2009-SYS-06, 13-7-5, and 081206). We thank L.R. Roberta, W.F. McDonough and Qiu L. for their help with MC-ICP-MS measurements.

# Geochemistry of Late Archean Bababudan metasediments, Dharwar Craton, India: Implications on redox conditions

D.V. SUBBA RAO AND B. SREENIVAS

National Geophysical Research Institute (CSIR), Hyderabad 500007, India (dvsubbarao@ngri.res.in)

The Dharwar craton of southern India comprises Middle to Late Archean granite-greenstone sequences with a variety of metasediments. The Dharwar Supergroup consisits of 2.7 Ga old Bababudan and 2.6 Ga old Chitradurga Groups. These supracrustal sequences consist large amount of banded iron formations (BIF) with minor amount of manganese formations. In this study we present geochemical characteristics of metasediments of the Bababudan Group with particular relevance to the Precambrian redox evolution.

A quartz pebble conglomerate (QPC) unit overlying the basement gneisses at the base of the Bababudan Group consists detrital uraninite and pyrite grains indicating reducing conditions during their deposition. These conglomerates are similar to those occurring at the base of the Huronian Supergroup of Canada. Following the QPC, fluvial quartzites interbedded with metabasaltic lava flows form the basal unit. In some of these basal parts of the Bababudan Group chloritic schists occurring intermittently with metabasaltic flows show high $Al_2O_3$ (20.56 %) and $K_2O$ (4.78 %) contents indicating that they may represent basal section of a metasomatised Precambrian paleosol similar to the 2.7 Ga Mt. Roe and Bird paleosol profiles of Australia and South Africa, respectively. The interlayered fluvial quartzites show very low $Fe_2O_3$/FeO (0.08 to 0.48) indicating low oxygen concentrations in the provenance of these sediments. Some of the metapelites of mafic affinity (chlorite phyllites) also show such low $Fe_2O_3$/FeO values. The BIFs of the Bababudan Group are characterized by high positive Eu anomalies, when normalized to chondrite, with a very large range likewise to many other 2.7 Ga old BIF sequences from all over the world (Sreenivas and Murakami, 2005). It is considered that the 2.7 Ga period witnessed intense mantle plume activity resulting in highly reducing conditions. The geochemical characteristics of metasediments of the 2.7 Ga Bababudan Group corroborate the above proposition.

[1] Sreenivas, B. & Murakami, T. (2005) *Jour. Min. Petrol.* **100**, 184–201.