# New geochronological constraints on the Ruili Metamorphic Belt in western Yunnan, China

C.K. LAI [1*], KHIN ZAW [1] AND S. MEFFRE [1]

[1] ARC Centre of Excellence in Ore Deposits, University of Tasmania, Hobart, Tasmania, Australia (*correspondance: chunkitl@utas.edu.au)

The Ruili Metamorphic Belt is located in westernmost Yunnan near the Chinese–Myanmar border. The belt trends NE–SW and comprises mainly augen gneiss, two-mica schist, and plagioclase amphibolite, with various generations of (meta)-granitoids. The Ruili Metamorphic Belt is located close to the Sibumasu-West Burma suture and may extend into the Mogok Metamorphic Belt in NE Myanmar, which hosts rich orogenic sediment-hosted gold and gemstone (e.g., ruby, sapphire) natural resources [1,2]. However, no regional geological correlation between these two belts has been attempted. The new U-Pb zircon age data reported here suggest a complex tectonic history for the belt, with at least four major magmatic/metamorphic phases, as follows:

1. Early Cretaceous (ca. 125-116 Ma);
2. Late Cretaceous (ca. 70-68 Ma);
3. Late Palaeocene (ca. 58 Ma);
4. Eocene (ca. 35-49 Ma).

When compared to the Mogok Metamorphic Belt in Myanmar [1-4], the Jurassic (ca. 170 Ma) and Late Oligocene-Miocene (ca. 20-25 Ma) magmatic/ metamorphic events there have not yet been found in the Ruili Metamorphic Belt, whereas Late Cretaceous metamorphism has not yet been documented in the Mogok Metamorphic Belt. Much more data will be required to clarify their heating and exhumation history and regional tectonic relations between these two belts.

[1] Barley *et al*.. (2000) *GSA abs* **59**, 18. [2] Barley *et al*.. (2003) *Tectonics* **22**, 1019. [3] Searle *et al*.. (2007) *Tectonics* **26**, TC3014. [4] Mitchell *et al*.. (2012) *JAES* **56**, 1-23.

# High-Precision Mg-isotope Measurements of Peridotites and Bulk Chondrites

Y.J. LAI [1,2]*, P.A.E. POGGE VON STRANDMANN [3], T. ELLIOTT [2], S.S. RUSSELL [4] AND R.A. BROOKER [2]

[1] Isotope Geochmistry and Cosmochemistry, Inst. of Geochemistry and Petrology, ETH Zurich, Clausiusstrasse 25, 8092 Zurich, Switzerland
[2] Bristol Isotope Group, Dept. of Earth Sciences, Univ. of Bristol, Queens Road, Bristol, BS8 1RJ, UK
[3] Dept. of Earth Sciences, Univ. of Oxford, South Parks Road. Oxford, OX1 3AN, UK
[4] Dept. of Earth Sciences, Natural History Museum, Cromwell Road. London, SW7 5BD, UK
(*correspondence: yi-chen.lai@erdw.ethz.ch)

As one of the most abundant constituent elements, magnesium may have the potential of providing information on the initial composition of primordial building blocks of planetary bodies, especially the processes that fractionate isotope compositions during planetary accretion and differentiation can be studied by comparing the Mg isotope composition of the Earth and meteorites. The dominant reservoir of Mg for the bulk silicate Earth is the mantle (> 99%). This makes it possible to attain a representative samples of the bulk Earth by selecting samples that best representing the Earth's mantle. Here, we present high precision Mg isotope data (<0.03 ‰ on $\delta^{26}$Mg based on long-term analyses of geological reference peridotite, JP-1, n=17) of tectonically emplaced peridotite massifs to avoid diffusive perturbation observed on small mantle xenoliths, which we compare with bulk chondrites, chondrules and CAIs from CV chondrites. More than 10 repeat measurements of the Mg isotope ratios on small amount of samples were obtained to reduce standard error of the determinations and gain a statistically meaningful comparison between bulk chondrites, peridotites, chondrules and CAIs. The Mg isotope data of peridotites fall within a narrow range of $\delta^{26}$Mg values and give mean values of -0.23 ± 0.04‰. However, there is a relatively large range of $\delta^{26}$Mg values in analysed chondrules and CAIs. The Mg isotope data of carbonaceous chondrites are slightly lighter than the terrestrial peridotites. The inconsistent Mg stable isotopic composition between the Earth and carbonaceous chondrites, and hence the possibility that the Earth consists of non-carbonaceous-chondritic Mg, has important implications for Earth's bulk composition and primordial building material of the Earth.


DOI:10.1180/minmag.2013.077.5.12