Geophysical Research Abstracts
Vol. 16, EGU2014-1581-2, 2014
EGU General Assembly 2014

Implications of magmatic records for Neotethyan subduction beneath the Eurasian margin (Lhasa terrane, southern Tibet)

Jieqing Tan (1,2) and Jonathan Aitchison (2)

(1) College of Geoscience and Surveying Engineering, China University of Mining & Technology, Beijing, 100083,China (yingzhajii@gmail.com), (2) School of Geosciences, The University of Sydney, Sydney, NSW 2006, Australia

Evidence for magmatism is widely developed in the Lhasa terrane of southern Tibet. Much of this is related to northward subduction of the Neotethyan Ocean prior the India-Eurasia collision. To better understand the tectono-magmatism, we systematically studied the published data for Middle Jurassic-Eocene igneous rocks in southern Tibet. Many of these rocks formed during two important intervals from ca. 110-80 Ma and ca. 65-40 Ma. On the basis of the reported rocks in this area, we considered the possibility that a Neotethyan mid-ocean ridge was subducted during the early peak episode (ca. 110-80 Ma). With this ridge subduction system, hot asthenosphere rose up through a slab window causing both oceanic slab and mantle wedge melting that resulted in peak volcanism during the Late Cretaceous. As young and hot crust at a mid-ocean ridge has a relatively low density, and thus potentially positive buoyancy, the subduction of a buoyant mid-ocean ridge may have led to a reduction in the angle of subduction. Evidence for termination of arc magmatism by the flat subducted oceanic slab is recorded by a magmatic gap ca. 80-65 Ma.

Around ca. 65 Ma, the magmatic record appears again accompanied by a southward migration that represents resumption of an oceanic slab subduction at a normal subduction angle. Subsequently, magmatism lasts to ca. 36 Ma before the India-Eurasia collision and reached a peak of activity associated with a magmatic flare-up at 50 Ma. In this subduction system, some magmatic processes triggered formation of porphyry ore deposits and affected the temporal and spatial distribution of ores.