Late Mesozoic volcanism across E. Mongolia and Great Xing'an Range, NE China: Geochemical constraint on the post-collisional extension

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Late Mesozoic volcanic rocks are extensively distributed in the eastern section of Central Asia Orogenic Belt and constitutes major part of Great Xing'an Range in NE China, as well as in eastern Mongolia and adjacent to the border of Russia. These volcanic rocks show a wide range in compositions from basaltic andesite, trachyandesite and trachydacite to rhyolite. The majority of volcanic rocks exhibit high-K calc-alkaline affinity with the subordinate showing shoshonitic features. They are characterized with low MgO contents, LILE, LREE enrichment and HFSE depletion. They have depleted to weakely enriched Sr-Nd isotopic compositions. All these geochemical features are similar to the Cenozoic volcanics in Basin and Range province of west United States. Elemental and isotopic variations suggest that fractional crystallization with the predominant removal of olivine and orthopyroxene play an important role in the formation of the SiO_2-rich volcanics. Most of the basic and intermediate volcanic rocks are generated from an enriched lithospheric mantle which was metasomatized by fluids released from subducted slabs during the closure of the Paleo-Asian and Mongol-Okhotsk oceans. The generation of such widely distributed volcanic rocks was caused by the decompressional partial melting of enriched lithospheric mantle in an extensional regime, which was resulted from the gravitational collapse and upwelling of asthenosphere after the final closure of the Mongol-Okhotsk oceans from late Jurassic to Cretaceous.

Early Cretaceous Comei large igneous province in SE Tibet: Whole-rock Sr-Nd and zircon Hf isotopic constraints on mantle source characteristics

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The Early Cretaceous Comei large igneous province (CLIP) aged from ca. 145 to 128 Ma with peak activity at ca. 32 Ma was recently identified in SE Tibet [1]. The CLIP is dominated by dismembered mafic lava flows, sills and dikes, with subordinate ultramafic and silicic rocks. The mafic rocks in the CLIP can be subdivided into the high-Ti and the low-Ti groups in terms of TiO_2 and P_2O_5. Twelve SHRIMP zircon U-Pb age dates indicate that the high-Ti group is persisted from ca. 145 Ma to 128 Ma, and the tholeiitic magmatism is occurred at 132 Ma, and continued to 128 Ma [1]. The Sr-Nd isotopic compositions of 17 uncontaminated high-Ti group and 6 ultramafic samples [$(^{87}Sr/^{86}Sr)i$ = 0.70398 ~ 0.70596, $(^{143}Nd/^{144}Nd)i$ = 0.512502 ~ 0.512647, εNd(i) = + 0.67 ~ + 3.81] are interpreted to represent the isotopic signature of the Comei plume head. This isotopic composition overlaps those of basalts produced by the Kerguelen plume (e.g. the Rajmahal Group I, the Bunbury Casuarina, the Oligocene and upper Miocene Kerguelen plume materials, and the proposed Cretaceous Kerguelen "plume head" [2]). Weighted mean εHf(t) values of zircons from two dated high-Ti group samples are close to those of the Bunbury Casuarina and the Cretaceous Kerguelen "plume head" [2]. The prolonged alkaline magmatism of the CLIP favors plume head incubation beneath an originally thick lithosphere, as many flood-basalt provinces of the world would have [3]. We propose that the relative wide range of the proposed Sr-Nd isotopic compositions of Comei plume head would be ascribed to the relative long incubation of the Comei plume head beneath thick Eastern Gondwana lithosphere at the transition from the Late Jurassic to the Early Cretaceous time.

[1] Zhu *et al*. (2008) submitted. [2] Ingle *et al*. (2004) *Chem. Geol*. **209**, 83-106. [3] Sheth and Chandrasekharam (1997) *Phys. Earth Planet. Interior* **104**, 371-376.