



Paleogene Pseudoleucite Phonolites in South Tibet: Constrains on the Pre-collisional Mantle Characteristics

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Post-collisional (25-8Ma) ultra-potassic rocks occur along the NS-trending grabens or rifts in southern Tibet, which have been linked to the onset of east-west extensional stresses as the surface uplift of the Tibetan Plateau reached a near-maximum elevation. However, the petrogenesis of these rocks, especially source of enriched Sr-Nd isotopic compositions, remains controversial. Here we report on the Paleogene silicate-unsaturated pseudoleucite phonolite dike, in the Rongniduo area of central Lhasa terrane. Samples from this 62.7 ± 5.3 Ma (in-suit SIMS Apatite U-Pb age) dike have distinctly more depleted whole rock Sr-Nd ($(^{87}\text{Sr}/^{86}\text{Sr})_i = 0.7064$ to 0.7062 , $\epsilon_{\text{Nd}}(t) = -1.5$ to 0.4) isotopic composition, than those ($(^{87}\text{Sr}/^{86}\text{Sr})_i = 0.7128$ to 0.7406 , $\epsilon_{\text{Nd}}(t) = -18.0$ to -12.4) of Miocene (25-8 Ma) ultrapotassic rocks in the central Lhasa subterrane, respectively. We suggest that these ~ 62 Ma pseudoleucite phonolites could be derived from the enriched mantle metasomatized by subducted Tethyan oceanic materials, which provides important constraints on pre-collisional mantle characteristics beneath the Lhasa Block. Therefore, our new data indicate that the Miocene ultrapotassic rocks with the enriched Sr-Nd isotopic composition were most probably derived from a mantle source metasomatized by subducted Indian continental materials.