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Nature, geochemistry and petrogenesis of the syn-tectonic Amspoort suite (Pan-African Boundary Igneous Complex, Kaoko Belt, NW Namibia)

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Crucial information on the Neoproterozoic–Cambrian amalgamation of Western Gondwana is provided by studies of the large Pan-African collisional belt in central–northern Namibia. This so-called Damara Orogen (Miller, 1983) can be subdivided into two branches, the SW–NE trending Damara Belt and a roughly perpendicular, NNW–SSE trending Kaoko Belt further north. The Kaoko Belt consists of two principal crustal units. The easterly part has a Congo Craton affinity (a basement built mostly by $\geq$ 1.5 Ga granitic gneisses with Neoproterozoic metasedimentary cover), whereas the westerly Coastal Terrane consists of Neoproterozoic (c.850–650 Ma) metapsammites and minor metabasic bodies; no exposures of the basement were found. The at least 180 km long, NNW–SSE trending suture between both units was intruded by numerous syn-tectonic magmatic bodies with ages spanning the interval 580–550 Ma (Seth et al., 1998; Kröner et al., 2004) designated as the Boundary Igneous Complex by Konopásek et al. (2008). The most typical representatives of this syn-collision igneous association are c.550 Ma old K-feldspar-phyric, Bt $\pm$ Cam granites–granodiorites of the Amspoort suite, with minor Cpx gabbro and rare two-pyroxene dolerite bodies.

The petrological character, whole-rock geochemistry and Sr–Nd isotopic signatures of the scarce Opx–Cpx–Bt dolerites indicate an origin from a CHUR-like mantle-derived melts ($^{87}Sr/^{86}Sr_{550} \sim 0.7045$, $\varepsilon_{Nd}^{550} \sim 0$) modified by extensive (?Ol–) Cpx fractionation. The rest of the suite is interpreted as a product of a high-temperature anatexis of a heterogeneous lower crust, built mainly by immature metapsammites – rich in arc-derived detritus – with minor metabasite and intermediate metaigneous bodies. The most likely source appears to be the anatectic Coastal Terrane gneisses. Yet, partial melting of the so far little constrained Congo Craton cover, if formed by immature and youthful detritus unrelated to the basement, cannot be discounted. In any case, the rather primitive Sr–Nd isotopic compositions of the Amspoort suite (apart from dolerites; ε_{Nd}^{550} = -3.4 to -5.3, $^{87}Sr/^{86}Sr_{550}$= 0.7063–0.711), rule out any major role for the Congo Craton-basement derived material.

On a much broader scale, the contribution of Congo-derived material in the Pan-African granitoids in the Kaoko Belt seems to increase southwards from nearly nil in the studied suite, through minimal in Hoanib Valley (Seth et al., 2002) to maximum in southern extremity of the Belt (Jung et al., 2009 and, in particular, van de Flierdt et al., 2003).

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