ISOTOPIC CONSTRAINTS FOR THE ORIGIN OF PAN-AFRICAN GRANITOID ROCKS IN THE KAOKO BELT, NW NAMIBIA

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The geodynamic evolution of the Kaoko belt, NW Namibia, is considered to be the result of collision between the Congo (Africa) and Rio de la Plata (South America) cratons. In the coastal area of this belt Pan-African dioritic to granitic melts intruded at about 650 Ma and between 580 and 550 Ma into older metasedimentary sequences. It is suggested that the later intrusive episode coincided with the peak of high-grade metamorphism in this region which is characterised by granulite facies conditions and anatexis.Isotopic compositions of the Pan-African granitoids are characterised by moderate initial epsilon(Nd)-values (-1 to -7) and low initial 87Sr/86Sr values (0.7096). This indicates that these granitoids were not strongly evolved with respect to the Sr isotopic system, but the Sm-Nd system shows a distinct, although not very pronounced, isotopic evolution for the granitoid magmas. In contrast, Palaeoproterozoic and late Archaean orthogneisses from the adjacent Congo Craton reveal much lower epsilon(Nd)-values between -18 and -28 during the time of emplacement of the Pan-African granitoids, thus precluding the derivation of these melts exclusively from much older crust. Although the granitoids and the Pan-African metasediments have similar mean crustal residence ages between 1.2 and 1.6 Ga, the derivation from high-grade metasedimentary rocks alone seems also improbable since the granitoids reveal significantly lower initial 87Sr/86Sr ratios than the metasediments. It is assumed that the isotopic features of the Pan-African granitoids reflect mixing between upper crustal material (anatectic metaturbidites), remelted basement gneisses from lower crustal levels and, probably, small protions of juvenile material from the upper mantle.