ISOTOPIC CONSTRAINTS FOR THE ORIGIN OF A SYENITIC MAGMA IN THE SOUTHERN KAOKO ZONE, NAMIBIA

1,2SETH, B., 1OKRUSCH, M., 1WILDE, M. and 3HOFFMANN, K.H. 1Mineral. Institut, Univ. Würzburg, Germany; Max-Planck-Institut für Chemie, Mainz, Germany; 3Geol. Survey, Windhoek, Namibia.

The small Voetspoor syenitic intrusion in the Southern Kaoko Zone of the Damara Orogen, Namibia, cuts through weakly metamorphosed Pan-African metaturbiditic sequences. In this region, the Kaoko belt merges with the Northern Zone of the Damara belt, forming an orogenic triple junction. The crystallisation age of the Voetspoor syenitic intrusion has been dated by the Pb-Pb single zircon evaporation technique at 530+/-3 Ma which is ascribed to a late tectonic stage with respect to the major Pan-African deformation phase in this area. The syenitic magma was not strongly evolved with respect to the Sr isotopic system with initial 87Sr/86Sr ratios around 0.706. The Sm-Nd isotopic data of the syenite intrusion with moderate negative initial epsilon(Nd)-values of -3.9 to -4.9 are distinct from basement gneisses from the adjacent Congo Craton which reveal much lower epsilon(Nd, 530 Ma)-values of -20. The isotopic signatures, together with major and trace element characteristics, are interpreted as reflecting the nature of an enriched lithospheric mantle source rather than significant crustal contamination. Furthermore, the relations of initial Sr isotope ratios and epsilon(Nd)-values with major element oxides indicate that the source was heterogeneous with respect to the Rb/Sr ratios but rather homogeneous with respect to the Sm/Nd ratios. The enrichment of this mantle source may be the result of a Proterozoic subduction zone. The ascent of the syenitic magma might correspond to deep-reaching fault zones as a result of a late-tectonic extensional regime within the orogenic triple junction.