MONAZITE DATING AND PETROLOGY OF CORDIERITE BEARING GNEISSES FROM THE HIGHLAND COMPLEX - WANNI COMPLEX BOUNDARY, SRI LANKA

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The basement rocks of Sri Lanka can be subdivided from NW to SE into the Wanni Complex (WC), the Highland Complex (HC) and the Vijayan Complex (VC) based on differences in metamorphic grade and isotope model ages (MILISENDA et al. 1994). While the PT conditions of the HC were studied extensively and UHT conditions are well constrained, PT data from the WC and VC are less abundant but the common occurrence of migmatites and pyroxene bearing gneisses place the metamorphic grade into the granulite facies as well. Only few recent petrological and geochemical work has been done in the WC-HC boundary area (KITANO et al., 2018; WANNIARACHCHI & AKASAKA, 2016) which is ill defined but the SW of Sri Lanka displays cordierite and lower temperatures than the UHT HC. Age of the main metamorphic phase is ca. 580-570 Ma in the HC (SAJEEV et al., 2010) and ca. 580 Ma in the VC (KRÖNER et al., 2013). With U-Th-Pb monazite ages of around 530 Ma, the cordierite bearing assemblages from the WC are significantly younger representing post-peak thermal events (WANNIARACHCHI & AKASAKA, 2016). In this study, U-Th-Pb monazite dating combined with a petrological study including pseudosection modelling and thermobarometry was done focused on cordierite bearing migmatic biotite-garnet gneisses located at the WC – HC boundary in the SW to reconstruct its P-T-t path. The migmatic ortho- and paragneisses with the mineral assembly cordierite + garnet + biotite + plagioclase + k-feldspar + quartz + ilmenite + magnetite + spinel + silimanite contain monazites as garnet inclusion (Group1) and in the matrix (Group2). Group1 monazite ages cluster around 575 ± 5 Ma and 561 ± 5 Ma whereas ages of Group 2 cluster at 550 ± 3 and 527 ± 3, both groups showing complex chemical zoning. Based on the different ages and the textural occurrence of monazite we suggest that two thermal events at ca. 550-575 Ma and ca. 530 Ma are recorded in this rock type indicating a complex evolution during the late stage of the pan African orogeny. Obtained PT conditions are 700-750 °C and around 7 kbar. It is unclear if the main metamorphic phase in the WC belongs to the older or younger overprint and therefore more age data are needed.

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