



The ca 1.5 Ga zircons and monazites in charnockites from the western East European Craton

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In the west of the East European Craton (EEC), Palaeoproterozoic accretionary terranes are cross-cut by the several Mesoproterozoic Anorthosite-Mangerite-Charnockite-Granite (AMCG) suites. One of the largest, extending ca. 200 -300 km eastward from the Baltic Sea through northern Poland, Kaliningrad area to southern Lithuania and NW Belarus, displays all varieties of the AMCG rocks ranging from anorthosites, norites, monzodiorites to charnockite and porphyry granites. Charnockites, enderbites and opdalites occur as small bodies, intervals and small relics in boreholes among the AMCG rocks. The charnockites from Lazdijai 1 (Lz1, southern Lithuania) and Bilwinowo, Lanowiczhe and Wigry boreholes (northern Poland) consist of quartz, plagioclase, K-feldspar, orthopyroxene, biotite, zircon, apatite, monazite and opaques with or without garnet and clinopyroxene. They have slight variations in chemistry, display similar REE patterns with a subdued negative or even positive (Bilwinowo) Eu anomaly. Alumina content in orthopyroxenes is ranging from 4 to 5 % in Lithuania and reaching 7 % in Poland (Bilwinowo). Such high Al indicates that the crystallization of orthopyroxene should have occurred at high pressure. The high pressure up to 8-9 kbar was confirmed for the Lz1 rocks using garnet-biotite-plagioclase geothermobarometer. The U-Pb content in magmatic, oscillatory zoned zircons from the Lz 1 charnockite was determined by Cameca ims1270 instrument of the Nordic high-resolution ion-microprobe facility (NORDSIM) in Swedish Museum of Natural History, whereas monazites of Bilwinowo, Lanowiczhe and Wigry rocks were estimated by Cameca SX-100 electron microprobe (EPMA dating) at Warsaw University. The charnockite from Lz1 yielded a concordant age of 1517+-11 Ma (MSWD=0.48). Zircon cores were dated at 1850+-4.3 Ma and 1816+-6.3 Ma. In Lanowiczhe monazites

retained several episodes of their history. The most pronounced have been dated at 1447 \pm 20 Ma, 1542 \pm 20 Ma. The 1810 Ma and 1870 old central parts likely represent inherited grains. In Bilwinowo the homogeneous monazite yields an 1540 \pm 30 Ma age without any older inheritance. Both the zircon and monazite ages are in good agreement and provide important information on the evolution of the ca. 1540-1500 Ma AMCG suite. The 1850-1810 Ma cores in zircons and 1850 Ma central parts in monazites may indicate the age of source rocks for the AMCG magmatism. The 1850-1810 arc-related magmatic rocks are known elsewhere in the region. The good results obtained from monazites are encouraging for a broader application of the EPMA method for the dating of Precambrian rocks.