Petrogenesis of the orbicular granodiorite from the Yangtze nucleus

YIHE LI[1], JIANPING ZHENG[2], M. SATISH-KUMAR[3]

[1]China University of Geosciences, Wuhan 430074, China
liyh@cug,edu,cn
[2]China University of Geosciences, Wuhan 430074, China
jpzheng@cug,edu,cn
[3]Niigata University, Niigata 950-2181, Japan
satish@geo.sc.niigata-u.ac.jp

Huangling Orbicular Granodiorites (HOG), reported in the nucleus of the Archean Yangtze nucleus, developed with orbicules and matrix. The orbicules are mainly made up of amphibole and plagioclase, in different configurations as single shell (SS) or multiple shells (MS). Anorthite content of plagioclase in the SS decrease from core through mantle to matrix, displaying crystallization outward. A complex tendency is observed in MS, the inner part crystallized outward and the rhythmic shells crystallized inward in general. Besides, the Hb-Pl thermobarometry results indicate that the pressure of core in the SS (0.49 GPa) is lower than the inner part of the MS (0.63 GPa). The zircon U-Pb-Hf data from the outer-shell of the MS revealed that the HOG assimilated from local 1.96-1.85 Ga metapelites. Moreover, inner part of the MS recorded two episodes of ages at ~880 Ma and ~850 Ma separately. Hence, the HOG are considered to have formed in two stages: Magma blebs formed by ~880 Ma magma interacted with metapelite; latter, semisolid blebs were heated by ~850 Ma magma intrusion. Some of the blebs exploded by inner pressure increase, while some of them grew bigger with rhythmic re-crystallization, depending on the amphibole content.

Keywords: Orbicluar granodiorite; Cratonic nucleus; Petrogenesis.