ГЕНЕЗИС ОКРУГЛОГО Fe-КОРДИЕРИТА ИЗ ПЛУТОНА ТЕМАГВЕССИН (Ц. АХАГГАР, АЛЖИР)

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ORBICULAR Fe-CORDIERITE GENESIS FROM THE TEMAGUESSINE PLUTON (CENTRAL HOGGAR, ALGERIA)

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The Temaguessine high-level subcircular pluton is intrusive into the LATEA metacraton (Central Hoggar – Algeria) Eburnian (2 Ga) basement and in the Pan-African (615 Ma) granitic batholiths along a NW–SE oriented major shear zone. It is dated here (SHRIMP U-Pb on zircon) at 582±5 Ma (Abdallah *et al.*, 2007). Composed of amphibole-biotite granite and biotite syenogranite, it comprises abundant enclaves: mafic magmatic enclaves, country-rock xenoliths and remarkable Fe-cordierite (#Fe = 0.87) orbicules. The orbicules have a core rich in cordierite (40 %) and a leucocratic quartz–feldspar rim. They are interpreted as resulting from the incongruent melting of the meta-wacke xenoliths collapsed into the magma: the breakdown of the biotite + quartz assemblage produced the cordierite and a quartz–feldspar minimum melt that is expelled, forming the leucocratic rim. The orbicule generation occurred at T < 850 °C and P < 0.3 GPa. The Fe-rich character of the cordierite resulted from the Fe-rich protolith (wacke with 4 % Fe_2O_3 for 72 % SiO_2). The cordierite orbicules are composed of a cordierite-rich core (40 %) and a leucocratic rim. They are located in the centre of the pluton near a 100-m-long quartzite xenolith, in a place where the roof of the pluton collapsed into the granitic magma. The cordierite orbicules resulted from the incongruent melting of meta-wacke xenoliths that have fallen in the magma. The resulting quartz–feldspar minimum melt obtained through dehydration melting of the biotite was extracted by overpressure and formed the leucocratic rim. The solid product of the incongruent melting was highly peraluminous (A/CNK= 3.35), with a high proportion of cordierite. The orbicule generation occurred at T < 850 °C and P < 0.3 GPa. (3) The Temaguessine cordierite is particularly rich in iron (Fe# = 0.87). This is probably the consequence of a Fe-rich protolith (wacke with 4 % Fe_2O_3 for 72 % SiO_2). However, it is not sure if the Fe-rich and Al-rich composition of the biotite in the biotite syenogranite, enclosing the cordierite orbicules, is a consequence of the process (complete assimilation of smaller xenoliths) or implies some mixing between the granitic magma and the melt generated in the xenoliths. However, taking into account the leucocratic rim around the orbicules, we privilege the first interpretation.

Abdallah N, Liegeois J.P., De Waele B., Fezza N. et Ouabadi A. The Temaguessine Fe-cordierite orbicular granite (Central Hoggar, Algeria): U-Pb SHRIM age, petrology, origin and geodynamical consequences for the late Pan-African magmatism of the Tuareg shield. // Journal of African Earth Sciences, 2007, No 49, pp. 153-178.