

Provenance and Geotectonic Setting of the Ourika Gneissic Rocks (High-Atlas, Morocco)

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The gneissic massif of Ourika is composed by various facies that gather in two distinct and concordant groups: amphibole and biotite gneisses (GBA) in center and amphibolites and amphibole gneisses (GAA) in periphery. The difference in their compositions would be related to the diversity of the protoliths. This study made it possible to have some information on their origin and tectonic significance.

i) The two gneissic protoliths represent a medium-K calcalkaline from a subduction-related origin. They were peraluminous and S-type granitoids for GBA and metaluminous I-type diorites for GAA gneisses.

ii) The GBA and GAA protoliths that have until now been regarded as the PI terranes by many previous works, belong to a Pan-African orogeny. The GBA protolith seem to be generated by the melting of the crustal or immature sedimentary rocks after crustal thinning during the earlier Pan-African orogenic events, at c. 780 to 750 Ma. GAA protolith were formed in Panafrican island arc/fore-arc basin environments, at c. 743 Ma, from an anatexis related to the mantle injection in the juvenile continental crust.

iii) The two gneissic protoliths have been affected by an amphibolite to granulite-facies metamorphism ($700\pm 50^{\circ}\text{C}$) during the earlier Pan-African orogenic event and by a greenschist-facies metamorphism ($570\pm 30^{\circ}\text{C}$), very developed in GBA protolith, during the late Pan-African orogeny.

iv) The strong N-S gradient of Pan-African deformation would be thus responsible for the overlapping of the GBA on the GAA protolith as well as for the dome shape of the Ourika gneisses. The dome core corresponding to the GBA gneisses which has been strongly affected by this deformation, would have intruded, by ascending movements convectifs, in the heavy cover formed by the GAA gneiss.