

## Development of contact aureoles around Hercynian granites in central Morocco

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The contact aureoles are located in two structurally different areas, and formed within pelites series (Paleozoic) which was already affected by a low grade of regional metamorphism. The Oulmès aureole was generated by the syntectonic granite pluton along the axis of the Khouribga-Oulmès anticlinorium in a ductile shear zone. The Ment aureole, was generated on the eastern flank of the Fourhal - Telt synclinorium by the post tectonic granite pluton.

The high grade metamorphic encountered in the two aureoles indicates a hornblende hornfels facies. Mineralogical isograds defined in the peripheral zones of these aureoles show a concentric geometry around plutons, whereas those defined within the internal zones show either crossed or discontinuous geometries. The complexity of the patterns of these isograds is enhanced by hydrothermal alteration zones subsequently established within the internal parts of the aureoles.

The total composition of the country rocks influence on the modal percentage of mineral association. Indeed the low abundance of the plagioclase (5%) reflects the low ratios of  $\text{Na}_2\text{O}$  and  $\text{CaO}$ . The variation of the mineralogical composition with the growth of the metamorphic grade is expressed by the increase of  $\text{Fe}/\text{Fe}+\text{Mg}$  and  $\text{Ti}$  ratios in biotites, and by the increase of phengite in the white mica.

The observed variation of the whole rock composition within both aureoles is related to the initial composition of the sediments. However, variations characterized by the mobility of Cs, are due to hydrothermal alteration processes. Therefore, with the exception of the behavior of  $\text{H}_2\text{O}$ , Cs and Rb, the contact metamorphism of the two aureoles is considered as isochemical, and the intrinsic chemical system is generally closed.