# Textural and mineralogical variations associated with shearing of the Derraman peralkaline granites, Oulad Dlim massif, Morocco

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**Résumé**

The Derraman peralkaline granite outcrops in the Oulad Dlim Massif, west of the Archean part of the Reguibat Rise of the West African Craton. Structurally, the Oulad Dlim Massif exhibits an east-verging fold-and-thrust belt with polyorogenic characteristics, displaying both Neoproterozoic (Pan-African) and Palaeozoic (Hercynian) deformation events. The Derraman granite forms three distinct and heterogeneously deformed bodies within Archean gneisses and micaschists. U/Pb dating on zircon allowed to date its emplacement at 525 ± 3 Ma (Bea et al., 2016) and 40Ar/39Ar dating on muscovite to date its deformation to Late Carboniferous (310-290 Ma; Qillech et al., 2025). This work aims to characterize the textural and mineralogical changes associated with shearing of the Derraman granite and to precise the physical conditions of this deformation.

The deformation in the Derraman granite is characterized by the development of anastomosed cm-to-m-scale shear zones, where the isotropic granite is progressively transformed into mylonites and ultramylonite. The isotropic granite is medium- to coarse-grained and commonly displays agpaitic textures, with mesoperthitic alkali feldspar and quartz as dominant phases, while the mafic assemblage includes clinopyroxene (aegirine-augite), Ca-Na amphibole, and annitic biotite. Within the shear zones the mafic assemblage is commonly dissolved and replaced by iron–titanium oxides, which are dispersed or aggregated along the foliation plane. Perthite has fully recrystallized into fine-grained albite and orthoclase, which together with quartz define the foliation plane. Muscovite, biotite, and rarely amphibole (arfvedsonite), are aligned along the mylonitic foliation. Microstructures within shear zones reveal distinct recrystallization mechanisms: some zones are characterized by brittle fracturing of alkali feldspar and subgrain rotation recrystallization of quartz, whereas others exhibit widespread grain boundary migration recrystallization in both quartz and alkali feldspar.

The observed recrystallization microstructures, combined with the synkinematic growth of mica and amphibole, indicate that the Derraman granite experienced deformation under low- to medium-grade metamorphic conditions during the Late Carboniferous period.

*Intervenant

**Mots-Clés:** Deformation, Shear zones, metamorphic conditions, Derraman granites, Oulad Dlim Massif, West African Craton.