

The Ediacaran tectonic events, inferred from the Anisotropy of Magnetic Susceptibility (AMS) of the Imiter dyke swarms (Eastern Anti-Atlas, Morocco)

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Ediacaran volcanic dykes situated in the northern part of the Imiter Inlier (eastern Saghro, Anti-Atlas, Morocco) have been studied for their petrofabric using the Anisotropy of Magnetic Susceptibility (AMS) technique. Four dykes, namely TF, TD, FF and FE, oriented N25E, N40E, N50E and N10E, respectively, with andesitic compositions are considered to represent the same dyke swarm, emplaced during a first tectonic event. The volcanic dyke FW, oriented N90E displays a composition of alkali basalt and its emplacement is attributed to a second tectonic event.

These rocks are propylitized under greenschist facies conditions forming a secondary paragenesis constituted by calcite, chlorite, epidote and sericite. The dykes TF, TD, FF and FE are sub-volcanic moderate to high-K calc-alkaline, typical of post collisional (basalts)/andesites, belonging to plate margin andesites. The FW dyke shows a within-plate basalt signature, and its alkaline affinity reflects a different petrogenetic process.

The thermomagnetic analyses show a dominantly ferromagnetic behaviour in the TF dyke core carried by single domain Ti-poor magnetite, maghemite and pyrrhotite. The dominantly paramagnetic susceptibilities in TF dyke rims and TD, FE, FF and FW dykes are controlled by ilmenite, amphibole, pyroxene and chlorite.

The magnetic fabrics of the Imiter dykes, determined by our AMS study, allowed us to reconstitute the tectonic conditions which prevailed during the emplacement of these two generations of volcanic dykes. The first tectonic event was characterized by a roughly NE-SW compression and the second tectonic event is characterized by an E-W compression followed by a relaxation marking the end of the Pan-African orogeny in the eastern Anti-Atlas.

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