

MICROSTRUCTURE AND DEFORMATION TEMPERATURE CONDITION OF ALIABAD-E DAMAQ MYLONITIC GRANITE

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Sanandaj-Sirjan metamorphic zone has recorded a complex tectonic and metamorphic events with active Plutonism (Stocklin, 1968). Hamedan region due to the diversity of important metamorphic rocks and intrusive bodies such as Alvand and deformed granite Ali Abad-e Damaq has been considered as part of this mass in the shear zone (Berberian, 1977; Mohajjel, 1997; Mohajjel et al., 2003). Ali Abad-e Damaq mylonitized granite-granodiorite is located in the southeast of Alvand granitoid (Figure 1) (Moghaddam, 2001). In terms of lithology, in this rock mass of quartz, the plagioclase feldspars, biotite and muscovite form the most minerals forming the mylonite granite mass of the study. In this study, we focused on the microstructures of the quartz and feldspars in order to determine the mechanism of the dynamic recrystallization and finally evaluate the temperature of the deformation. The strike of the mylonitic foliation is ~NE-SW with shallow to steep dipping to northwest and the stretching lineation is subhorizontal. Insight of the portion of the porphyroclasts to matrix; Ali Abad-e Damaq granite is a protomylonite. The shear senses indicators like mica fish, Oblique foliation, S-C shear bands and lencoid mineral aggregates and porphyroclasts demonstrate the dextral sense of shear. Quartz deformed grains reveals BLG-SGR dynamic recrystallization and feldspar grains shows weak undulose extinction and BLG dynamic recrystallization. Based on the temperature window of the mineral dynamic recrystallization presented by Passchier and Trouw (2005), Ali Abad-e Damaq granite, sheared at temperature ~450-500°C under the upper low-lower medium grade mylonitization (Figure 2).

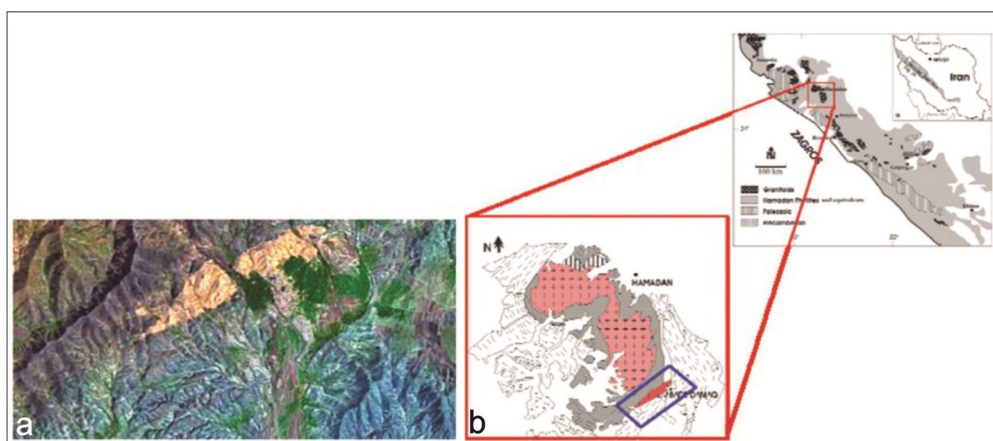


Figure 1. a) Satellite image of Aliabad Damagh granitoid and b) Geological setting of Aliabad Damagh granitoid in Iran (after Samanizadegan and Mohajjel., 2011).

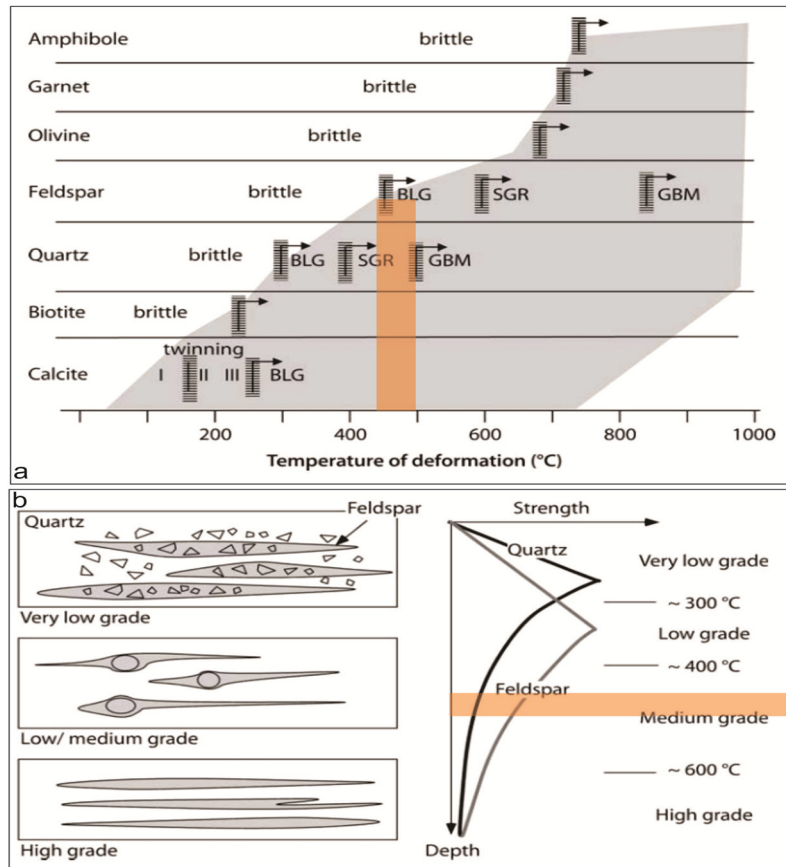


Figure 2. a) Temperature dependence of deformation mechanisms for different minerals. Bars indicate the transition zones. Arrows indicate the effect of strain rate. BLG, SGR, GBM – main types of recrystallisation. The ornamented domain is the domain of crystalplastic deformation (After Passchier and Trouw, 2005). Coloured rectangle represent 450-500°C temperature of the deformation and b) various kind of Mylonite based on the deformation temperature (after Passchier and Trouw, 2005). Coloured rectangle demonstrate Aliabad Damagh granitoid as upper low-lower medium grade mylonite.

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