



The magmatism and metamorphism at the Malayer area, Western Iran

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The Malayer area is located in the NW-SE aligned Sanandaj-Sirjan metamorphic belt, western Iran and consists mainly of Mesozoic schists so-called Hamadan Phyllites, Jurassic to Tertiary intrusive rocks and related contact metamorphic aureoles, aplites and pegmatites. The Sanandaj-Sirjan Zone is produced by oblique collisional event between Arabian plate and Central Iran microcontinent. Highest level of regional metamorphism in the area is greenschist facies and injection of felsic magmas is caused contact metamorphism. Magmatism is consist of a general northwest trend large felsic to intermediate intrusive bodies. The main trend of structural features i.e. faults, fractures and other structural features is NW-SE. The Malayer granitoid complex is ellipsoid in shape and has NW-SE foliation especially at the corners of the intrusions. Petrography of the magmatic rocks revealed recrystallization of quartz and feldspars, bending of biotite, and alignment of minerals parallel to the main trend of magmatic and metamorphic country rocks. These indicated that intrusion of felsic magma is coincide to the regional metamorphism and is syn-tectonic. Non-extensive contact metamorphism aureoles and rareness of pegmatite and aplite in the area are interpreted as injection of felsic magmas into the high-strain metamorphic zone. The regional metamorphic rocks mainly consist of meta-sandstone, slate, phyllite, schist. These gray to dark metasedimentary rocks are consist of quartz, muscovite, turmaline, epidote, biotite and chlorite. Sheeted minerals form extended schistosity and study of porphyroblast-matrix relationships shows that injection of granitic magma into the country rocks is syn to post-tectonic. Syn-tectonic indicating porphyroblast growth synchronous with the development of the external fabric. The thermal contact area of the granite can be observed in the contact margin of granite and regional metamorphic rocks, where it produced hornfels, andalusit-garnet schists and local feldspatisation. Hornfels has surrounded the Malayer intrusive body in its southern, eastern and to some extent northeastern parts. It shows a rather sharp contact with the granodiorite. According to field and microscopic investigations, an original clay-sandstone has been converted into hornfels due to contact metamorphism. Some small highly altered granitic patches are seen in the hornfels unit, especially close to its contact with the Malayer intrusive body.