

Ductile Transpressional Shear Zones in Mashhad granitoids, West of Mashhad, NE Iran

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In the northern slope of Binalud mountains (eastern continuation of Alburz mountains), an assemblage of metamorphic and ophiolitic rocks are existing. This complex consists of upper Paleozoic (probably Permian) to Triassic metamorphosed deep sea turbidities (including slates, phylites, metagravacs and quartzite) and metamorphosed ophiolitic rocks (represented by metamorphosed peridotite, gabbros, basalts, cherts and pelagic limestone). The rocks in this assemblage which are known as remnants of paleo-tethys oceanic realm are metamorphosed under green schist facies condition and are affected by multiple deformation during Cimmerian collision between Iranian microplate and Turan plate in late Triassic. The Mashhad ophiolitic and metamorphic complex was intruded by Mashhad granitoids in three different episodes of magmatism. Dehnow pluton with diorite-granodiorite composition was intruded in earliest stage of magmatism in late Triassic Norian (215 ± 4 My). This pluton is cut across by the NW-SE trending ductile shear zones which are dominated by an intense ductile deformation. The rocks of the Dehnow pluton along the shear zones are converted into mylonite and ultramylonite with steeply dipping mylonitic foliation and gently plunging stretch lineation on it. Kinematic analysis of shear sense indicators such as S-C fabrics, asymmetric folds, asymmetric porphyroclasts, mica fish and domino-type fragmented porphyroclasts reveal that the ductile deformation is related to right lateral reverse slip that may describe by transpressional deformation regime. The minerals in mylonitic rocks shows variable microstructures .patchy to crosshatch undulose extinction, shear fracture, deformation lamellae, subgrain formation, bulging dynamic recrystallization (BLG) and subgrain rotation recrystallization (SGR) in quartz grains, also subgrain formation, deformation twins, flame-shaped porphyroclasts, dynamic recrystallization (BLG) in feldspars, all indicated that the ductile deformation have been taking place in 400-500 °C (upper green schist and lower amphibolites facies conditions).

Key words: *Shear zone, ductile deformation, Transpression, Mashhad metamorphic complex*