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Post-collisional monzonitic magmatism from the Zagros hinterland. Implications on lithospheric processes

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During Cenozoic, convergent movement between Iranian and Arabian plates caused generation of the Zagros orogenic belt in the SE margin of the Eurasia continent. Complex evolution of the belt during different tectonic processes including subduction, collision and post collision events formed various magmatic rocks with varied magmatic affinities and origins. The Arasbaran volcano-plutonic zone in the NW Iran includes NW-SE trending large intrusive bodies with different units and magmatic cycles, which are hosted by Oligocene volcano-sedimentary rocks. Shoshonitic (monzonitic) intrusives are the main bodies as well as high-K calc-alkaline granodiorites in the zone. Shoshonitic associations include monzogabbro, monzodiorite, monzonite and syenitic/granitic compositions. These rocks show real shoshonitic characteristics as high total alkalies (>5 wt.%), high K2O/Na2O, high Sr, Ba, LREE, low TiO2 (<1.3 wt.%) and high but variable Al2O3. It is proposed that shoshonitic associations in the Arasbaran zone resulted by decompression melting of a metasomatized sub continental lithospheric mantle source.

Convergent tectonic regime between Arabian and Iranian plates since Mesozoic times consumed Neotethys oceanic crust by continuous subduction beneath Iranian plate, which caused a magmatic arc with clear calc-alkaline affinities and a metasomatic lithospheric mantle beneath Iranian plate. Final collision between the two plates, Arabia and Asia, along Zagros suture zone in Early Cenozoic, produced a thickened lithosphere in the area. Post collisional relaxation caused mantle melting by decompresion producing the shoshonitic and monzonitic magmatic associations.