Geochemistry and geological setting of turquoise hosted intrusive bodies in Damghan (Baghou) turquoise-gold mine, Torud-Chah Shirin volcano-plutonic segment.

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Abstract: Sub-volcanic diorite and granodiorite intrusive bodies (Middle Eocene) and dome shaped rhyolite have intruded into Lower to Middle Eocene volcanic rocks in Torud-Chah Shirin magmatic segment. The granodiorite plutons and rhyolitic dome host turquoise and gold mineralization in Damghan mine. Intrusive bodies display characteristics of high potassium CA and meta-aluminous (diorite and some of granodiorite samples) to per-aluminous (rhyolite and some of granodiorite samples). Comparison of TiO₂-La-Hf and Zr-Nb-Ce / P₂O₅ values, as well as Rb to Y + Nb ratios indicate that magmatism is related to post-collisional tensional regime after closure of Neotethys. On the other hand, the metasomatism of mantle due to the fluids release from subducted oceanic slab has caused high ratio of LILE / HFSE with negative anomalies of Ti, Nb and Ta in magma. Partial melting of the metasomatized mantle has led to the formation of primary magma, which eventually has generated diorite, granodiorite, and rhyolite magmas by fractional crystallization, crustal assimilation and magma mixing.

Keywords: Granodiorite; post collision; Damghan; Baghou; turquoise.

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