

Geochemical implications of magmatic rocks in the west of Sabzevar Range, NE of Iran

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Sabzevar Range includes the NW-SE-trending ophiolitic belt which located at the northern edge of the Central East Iranian micro-continent and contains all members of an ophiolitic sequence. This ophiolitic assemblage has been intruded by numerous magmatic bodies. Major part of these magmatic intrusives have adakitic signature with broad compositional range of different plutonic [1] and volcanic-suvolcanic rocks [2]. Here, the geochemical and petrological characteristics of igneous rocks in the SW of Sabzevar Range have been studied. This area is located out of ophiolitic belt and appears close association of adakitic and high Nb basaltic (HNB) rocks. Adakites are calc-alkaline and include trachyandesite, teachy-dacite and dacite. These rocks are enriched of Na₂O, Al₂O₃ and Sr and depleted from MgO, Y and Yb. Adakitic samples are defined by high Sr/Y (88-128) and La/Yb (20-45) ratios; and lack Eu anomaly (Eu/Eu* = 0.92-0.99) in REE patterns. Geochemical composition indicates adakites formation by slab melting in a high pressure-high heat flow subducting setting. Different adakitic rocks have been formed by various slab partial melting degrees and reaction of adakitic magma with heterogeneous mantle wedge. HNB rocks are alkaline, nepheline normative and sodic (Na₂O/K₂O = 2.7-3.4) with high concentration of Al₂O₃, TiO₂, MgO, P₂O₅, LILE and HFSE, especially Nb (30-56 ppm). These basalts show fractionated REE patterns with high LREE/HREE (La_N/Yb_N = 20-25) and trace elements modeling suggests their generation by low partial melting degrees (<2%) from garnet-peridotite origin which already metasomatized by adakitic melts.

[1] Rossetti, F., Nasrabady, M., Theye, T., Gerdes, A., Monié, P., Lucci, F., and Vignaroli, G.: Adakite differentiation and emplacement in a subduction channel 2014, The late Paleocene Sabzevar magmatism (NE Iran), *Geol. Soc. Am. Bull.* **126**, 317–343. [2] Jamshidi Kh., Ghasemi H., Troll V.R., Sadeghian M., and Dahren B. (2014) Magma storage and plumbing of adakite-type post-ophiolite intrusions in the Sabzevar ophiolitic zone, NE Iran. *Journal of Solid Earth* **6**, 49-72.