

Accepted Manuscript

Geochemistry, petrogenesis and tectonic setting of middle Eocene hypabyssal rocks of the Torud–Ahmad Abad magmatic belt: An implication for evolution of the northern branch of Neo-Tethys Ocean in Iran

Fazilat Yousefi, Mahmoud Sadeghian, Christina Wanhainen, Habibollah Ghasemi, Dirk Frei



PII: S0375-6742(17)30188-7
DOI: doi: [10.1016/j.gexplo.2017.03.008](https://doi.org/10.1016/j.gexplo.2017.03.008)
Reference: GEXPLO 5905

To appear in: *Journal of Geochemical Exploration*

Received date: 30 August 2016
Revised date: 22 January 2017
Accepted date: 17 March 2017

Please cite this article as: Fazilat Yousefi, Mahmoud Sadeghian, Christina Wanhainen, Habibollah Ghasemi, Dirk Frei, Geochemistry, petrogenesis and tectonic setting of middle Eocene hypabyssal rocks of the Torud–Ahmad Abad magmatic belt: An implication for evolution of the northern branch of Neo-Tethys Ocean in Iran. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. *Gexplo*(2017), doi: [10.1016/j.gexplo.2017.03.008](https://doi.org/10.1016/j.gexplo.2017.03.008)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

**Geochemistry, petrogenesis and tectonic setting of middle Eocene
hypabyssal rocks of the Torud–Ahmad Abad magmatic belt:
An implication for evolution of the northern branch of
Neo- Tethys Ocean in Iran**

Fazilat Yousefi^{1*}, Mahmoud Sadeghian¹, Christina Wanhainen², Habibollah Ghasemi¹, Dirk Frei³

1: Department of Petrology and Economic geology, Faculty of Earth Sciences, Shahrood University of Technology, Shahrood, Iran.

2: Department of Civil, Environmental and Natural Resources Engineering, Lulea University of Technology, Lulea, Sweden.

3: Department of Earth Science, Faculty of Natural Science, University of the Western Cape, Western Cape, South Africa.

*Corresponding author: Fazilat Yousefi
Email address: f.yousefi87@gmail.com

Abstract

The Torud–Ahmad Abad magmatic belt is located in the south-southeast of Shahrood (Esat of Semnan Province, NE Iran) and lies in the northern part of the Central Iran Structural Zone (CISZ), where a thick sequence of Paleocene to middle Eocene volcanic and volcanosedimentary rocks cropped out. This sequence was intruded by numerous dikes, hypabyssal igneous domes and one small gabbrodioritic intrusion, with compositions ranging from trachybasaltic andesite, trachyandesite, dacite, trachyte, gabbro, diorite and syenite. Various enclaves (cogentic and noncogentic) with different composition, size and shape have been found in these domes and dikes. These enclaves are evidence of magma mixing and crustal contamination. Geochemically, the studied rocks exhibit a calc-alkaline to high potassium calc-alkaline affinity, and are enriched in LREE and LILE and depleted in HREE and HSE. Other geochemical characteristics, such as a silica content varying between 59- 63 wt % and 51- 59 wt%, a Na₂O content >3wt%, Al₂O₃ content >16wt%, Yb <1.8 ppm, and Y <18 ppm, makes it possible to classify these rocks as high silica adakite in the Ahmad Abad region and low silica adakite in the Sahl-Razzeh region or at least, adakitic like rocks. Also, depletion of Nb and Ti, and high enrichment in Rb, Ba, K and Th, implies crustal contamination of the mentioned adakitic domes. The petrographical and geochemical evidence show that the magma forming of the high silica adakites has been originated from partial melting of the subducted oceanic slab of Neo-Tethys (Sabzevar–Darouneh branch) in amphibolite to eclogite facies and the low silica adakites formed by partial melting of the metasomatized or modified mantle wedge, above the subduction zone. Gabbroic to syenitic rocks are the products of fractional crystallization of basic magma which originated from a nearly non-modified mantle wedge above the subducted oceanic slab. U-Pb dating of the dacitic and andesitic rocks belong to hypabyssal rocks yielded age of 41.4±0.3 Ma, and 35.5±0.2 Ma respectively and consistent to Middle to Late Eocene.

Download English Version:

<https://daneshyari.com/en/article/5754553>

Download Persian Version:

<https://daneshyari.com/article/5754553>

[Daneshyari.com](https://daneshyari.com)