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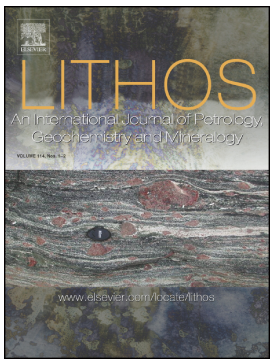

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Anna Lechmann, Jean-Pierre Burg, Peter Ulmer, Marcel Guillong, Mohammad Faridi

PII: S0024-4937(18)30040-9
DOI: https://doi.org/10.1016/j.lithos.2018.01.030
Reference: LITHOS 4557

To appear in:

Received date: 31 August 2017
Accepted date: 21 January 2018

Please cite this article as: Anna Lechmann, Jean-Pierre Burg, Peter Ulmer, Marcel Guillong, Mohammad Faridi , Metasomatized mantle as the source of Mid-Miocene-Quaternary volcanism in NW-Iranian Azerbaijan: Geochronological and geochemical evidence. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Lithos(2018), https://doi.org/10.1016/j.lithos.2018.01.030

Metasomatized mantle as the source of Mid-Miocene-Quaternary volcanism in NW-Iranian Azerbaijan: geochronological and geochemical evidence

Anna Lechmann[a,*], Jean-Pierre Burg[a], Peter Ulmer[a], Marcel Guillong[a], Mohammad Faridi[b]

[a] *Department of Earth Sciences, ETH Zurich, Sonneggstrasse 5, 8092 Zurich, Switzerland*

[b] *Geological Survey of Iran, Northwestern Regional Office, 5133-4359 Tabriz, Iran*

Corresponding author: Tel +41 44 632 71 28, e-mail address anna.lechmann@erdw.ethz.ch (A. Lechmann)

1. ABSTRACT

Middle Miocene to Quaternary volcanic rocks cover large areas of the Azerbaijan Province in NW Iran. This study reports two separate age clusters out of 23 new LA-ICP-MS U-Pb zircon ages: (1) Middle Miocene (16.2 - 10.6 Ma) and (2) Latest Miocene-Late Pleistocene (5.5 - 0.4 Ma). Major and trace element bulk rock geochemistry and initial Sr, Nd, Pb radiogenic isotope data on the dated rocks provide new constraints on the Mid-Miocene to Quaternary volcanism in this region. The analyses are distributed over a large compositional range from low-K to high-K calc-alkaline andesites and dacites/rhyolites to more alkaline trachybasalts and dacites with shoshonitic affinities. Chondrite-normalized REE patterns are steep with significant enrichment in LREE and low abundances of HREE indicating a garnet control. Plots of primitive mantle-normalized trace elements show negative Ti and Nb-Ta anomalies indicative of an arc signature. The wide compositional range and the ubiquitous presence of an arc signature reveal that the source mantle is heterogeneous and metasomatically altered. Sr, Nd and Pb radiogenic isotope