

## Geochemistry, petrology and proposed tectonomagmatic model for generation of alkaline basic rocks in the base of the Shemshak Formation, the eastern Alborz zone

H. Ghasemi\*, K. Jamshidi

*Faculty of Earth Sciences, Shahrood University of Technology, Shahrood, Iran*

(Received: 16/8/2010, in revised form: 16/1/2011)

**Abstract:** Basaltic lavas have been reported at the base of the Shemshak Formation in some areas of the Alborz zone. However, detail observations of geological outcrops in different areas in eastern Alborz show that these rocks in most aereas around Shahrood (e.g. Gheshlagh in Khosh Yeilagh area) and Damghan (e.g. Tazare, Talo and Kalate Rodbar) are intrusive as sill, dike and small stocks and in few areas of Damghan (e.g. Cheshmeh Ali and Toyedarvar) and Semnan (e.g. Shahmirzad) are basaltic flows. High contents of Ti and P and alkaline nature of parental magma, supported by presence of apatite, primary and secondary sphenes and phlogopite in these rocks. Identification diagrams of magmatic series and tectonic setting discrimination diagrams have been proved an alkaline nature and intracontinental setting for these rocks. Enrichment in LREE and highly incompatible elements and depletion in HREE are obvious in chondrite and primitive mantle normalized spider diagrams. Parallel trends in patterns of REE variations, Pb-positive anomaly associated with patterns of compatible versus incompatible elements variation diagrams, indicating an unique source for these igneous rocks and the main role of fractional crystallization in the evolution of magma, although, minor amounts of assimilation and contamination of magma by crustal rocks occurred too. Geochemical investigations indicate that this alkaline magma has been formed by low degrees partial melting (10-15 %) of an enriched subcontinental lithospheric garnet-lerhzolitic mantle in an extensional intracontinental environment. This environment was an extensional proto-back-arc basin located on the passive continental margin of Alborz during Late Triassic-Early Jurassic time.

**Keywords:** *Geochemistry; petrology; basic rocks; Shemshak; Alborz.*

متن فارسی اصل مقاله از صفحه ۶۹۹ تا ۷۱۴ در این شماره به چاپ رسیده است.

\*Corresponding author, Tel-fax: (0273) 3396007, Email: h-ghasemi@shahroodut.ac.ir