



## The petrology of Eocene volcanic rocks in 1:100000 Abrishamrud sheet

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### Abstract

The study area is located Northeast of Trude in Semnan province and is considered as part of the North central Iran zone that is separated from Alborz- binalud zone by Miamay fault in the North. The oldest rock unites consists of Gneiss, Schist and Marble of pre- Jurassic. The Qurternary alluvial terraces are the youngest deposits.

Eocene rock unites within study area are middle and middle-upper Eocene. Middle Eocene rocks are marine sedimentary deposits of Lutetion. At middle-upper Eocene volcanic activities are explosive as well as lava flows, which have mostly appeared scattered and irregular.

The Volcanic activities in middle-upper Eocene, are mainly of intermediate, basic and acidic composition respectively. Although in some areas basic rocks occur in upper levels relative to intermediate rocks, in most cases they seem to be disorderly spread in study area.

The intermediate rocks are calc- alkaline, medium- high potassic trachy andesites.

The basic rocks within study area are basalt and alkali basalt. The alkali basalt rocks are high potassic and have evolved from a more basic magma. The acidic rock unites consists of pyroclastic and acidic volcanic rock, with dacitic composition.

The gap between basic and intermediate rocks in geochemical diagramms, indicates that not only fractionation but also assimilation, contamination and specially gaseous transfer have evolved the basic magma, within study area.

The gap between intermediate and acidic rocks in geochemical diagramms, indicative of a crustal original acidic magma.

It seems that in Eocene, the mantle derived basaltic magma has ascended towards the surface and may be to pond within the crust. In such a situation, besides fractionation as well as assimilation and gaseous transfer have caused, the basic magma change into a calc-alkaline, low density intermediate and acidic magma in upper parts.

It is suggested that in middle- upper Eocene, the resulting low density magma, caused uplifting and fracturing of the crust, subsequently the intermediate and acidic magma ascended and caused subaerial - submarine eruption of the magma as well as aerial lava flow, depending on the existing environment.