

Ba-rich sanidine megacrysts in trachytic rocks of Eslamy volcano, NW Iran

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The Eslamy volcano is located on a peninsula at the eastern coast of Urumieh lake, NW Iran. The complex stratovolcano with gentle slope flanks exposes a collapsed caldera in the central part.

Specific features are different sanidine rich rocks that occur in form of ejecta and flows. According to the field observations they are products of one volcanic event. XRF measurements show they all have trachytic compositions. Typical for this locality are the large sanidine phenocrysts.

In the trachytic flow the sanidine crystals reach average size of ~4 cm embedded in a greenish-blue matrix consisting mainly of crystallized feldspar and subordinate pyroxen. Occasionally feldspar megacrysts of approx. 10 cm were observed. Na content of the sanidine megacrysts varies between 0.05 – 0.5 pfu with higher concentrations in the cores. Furthermore they show oscillatory zoning patterns caused by variations of Ba content (0-0.04 pfu). The matrix of the trachytic flow consist mainly of interlocking sanidine crystals (0.05-0.45 pfu Na) partly with Ba-rich cores containing up to 0.06 pfu Ba. In contrast to the megacrysts they show slightly higher Fe contents (0.025-0.035 pfu).

The volcanic ejecta with bombs of approx. 50 cm in size were found in one distinct layer within a pyroclastic horizon. The average diameter of the feldspar phenocrysts is much smaller (0.5-2 cm). Sanidine is the main phase of these rocks (up to 80 %). As mafic phase up to 30 % pyroxen (mainly diopside) ± biotite can be observed. Accessories are magnetite ± apatite ± titanite ± zircon. In contrast to the flow rocks the main phase of the matrix of the ejecta is always glass with higher Fe₂O₃ (total) contents (up to 6 wt.-%) indicating a fast cooling of the sample due to ejection. They are completely depleted in Ba. In two samples zoned feldspar relicts enclosed in glass show remolten rims.

Similar to flow rocks the feldspar phenocrysts of all ejecta show a complex zoning pattern, e.g. three samples expose high Ba contents within the core of the feldspars with a maximum Ba-content of 0.12 pfu. In addition, all phenocrysts show an oscillatory zoning pattern. The very fine rimmed zones are mainly caused by the variation of Ba content (0-0.06 pfu).