

Crystal size and shape distribution of plagioclase in the basaltic andesites, North of Gavkhouni

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(Received: 23/10/2018, in revised form: 22/1/2019)

Abstract: Plagioclase is the most abundant mineral in basaltic andesites in the north Gavkhouni. Olivine and pyroxene are the other rock forming mineral there. In their 3-dimensional shapes, they are unequal and varies between bladed to prolate. Plagioclase sometimes exhibit dusty texture, oscillatory zoning and sinusoid growth. Based on crystal size distribution data, the rate of crystal nucleation of plagioclase varies between 2.77×10^{-8} - 3.07×10^{-8} $\text{mm}^{-3} \text{s}^{-1}$ in 71.78 - 17.77 years. The results indicate the higher nucleation rate, rapid cooling and a short crystal residence time in the magma chamber. The crystal size distribution diagrams show the high frequency of smaller crystals and the coarsening of the average crystals. However, the presence of two populations of plagioclase indicates the interfering of new magma with the same chemical composition and new crystal population into the magma chamber. This event can increase the volume of the magma chamber pressure and eruption of the magma.

Keywords: *Basaltic andesite; crystal size distribution; crystal residence time; plagioclase.*

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