Crystal size distribution analysis of plagioclase and pyroxene in basaltic and andesitic rocks of Abbasabad Area, east of Shahrood

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Abstract: The Kahak- Abbasabad Eocene magmatic belt is situated in the northeast edge of Central Iran Zone and extended from Davarzan in the west of Sabzevar to Mayamey in the east of Shahrood. Rock units of the study area include an alternation of basic- intermediate volcanic rocks (olivine basalt, basalt, Trachybasalt, trachyandesitic basalt, trchyanesite and andesite) and pyroclastic–sedimentary rocks (varieties of tufts, breccia, agglomerate, sandstone, shale, conglomerate, nummulitic limestone and tuffaceous limestone), which belong to Upper-Middle Eocene, and sedimentary rocks of Oligocene and Quaternary. The volcanic rocks of this belt form a continuous fractional series, originated from a same parental basaltic magma. Hence, the basaltic-andesitic lava flows are pyroxene porphyry, plagioclase porphyry and pyroxene-plagioclase porphyry; they are favorable for Crystal Size Distribution (CSD) studies. According to calculations of this research, plagioclase and pyroxene phenocrysts of the volcanic rocks have been grown in magmatic chamber in time range of 86.20 to 118.01 years with nucleation rates from $1.48 \times 10^{-10}$ to $1.56 \times 10^{-10}$ mm{s$^{-1}$} and in time range of $3.21 \times 10^{4}$ to $6.34 \times 10^{4}$ years with nucleation rates from $0.55 \times 10^{-3}$ to $2 \times 10^{-5}$ mm{s$^{-1}$}, respectively.

Keywords: Crystal Size Distribution (CSD); Basaltic- andesitic rocks; Abbasabad; Shahrood.

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