

Geochronology and evolution of the youngest volcano in the Carpathian-Pannonian region

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The Ciomadul volcano in the Eastern Carpathians represents the youngest volcanic activity in the Carpathian-Pannonian Region. The volcanism was characterized primarily by lava dome extrusions and related PDC deposits although medium to large explosive eruptions also occurred. The volcanic products are high K-dacites with variable crystal content. Here, we present combined ²³⁸U/²³⁰Th disequilibrium and (U-Th)/He zircon ages (ZrHe) for pyroclastic deposits and lava domes. According to the disequilibrium corrected ZrHe eruption ages the volcanic activity occurred from 150 ka to 32 ka. Two main active phases were identified with a ~40 ka hiatus between them. The first phase was characterized by lava dome activity which was followed by a more explosive eruption phase with minor effusive activity at 56-32 ka when subplinian to plinian eruptions produced volcanic ash clouds that blanketed extended areas. The erupted dacitic magma was formed due to the remobilization of an upper crustal silicic crystal mush body by hot mafic magma [1]. The silicic crystal mush is represented by low-An plagioclase, low-Al amphibole, biotite and accessory minerals, such as zircon, titanite, apatite and allanite as crystal clots and solitary minerals in the dacites. Amphibole-plagioclase [1] [2] and Zr-in-titanite thermometry [3] yields 700-740 °C crystallization temperature indicating that the crystal mush was close to the solidus temperature well before the remobilization.

[1] Kiss et al. (2014) *Contrib. Mineral. Petrol.* 167:986. [2] Harangi et al. (2015) *J. Volc. Geoth. Res.* **290**, 82-96. [3] Hayden et al. (2008) *Contrib. Mineral. Petrol.*, 155:529-540.