Geophysical Research Abstracts,
Vol. 10, EGU2008-A-11292, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-11292
EGU General Assembly 2008

Magma evolution and magma ascent rate beneath Ciomadul, the youngest volcano in the Carpathian-Pannonian region

B. Kiss (1), S. Harangi (1), A.P. Vinkler (1,2) T. Ntaflos (3), P.R.D. Mason (4)

(1) Department of Petrology and Geochemistry, Eötvös University, Budapest, H-1117 Pázmány Péter sétány 1/C, Hungary (e-mail: geobalazs@gmail.com); (2) University of Milano, Milano, Italy (3) Department of Lithospheric Sciences, University of Vienna, Vienna, Austria (4) Petrology Group, Faculty of Earth Sciences, University of Utrecht, Utrecht, The Netherlands

The geodynamic evolution of the Carpathian-Pannonian Region (CPR) was accompanied by eruptions of various (basaltic to rhyolitic) magmas during the last 20 Ma. The last volcanic eruptions occurred quite recently (about 20-30 ka) at the southeastern part of the CPR. The youngest volcano of the CPR is the Ciomadul dacitic lava dome complex with a double crater inside. The volcanism of Ciomadul can be divided into an effusive, lava dome-building phase (500-900 ka) and an explosive volcanic phase (220?-20 ka). During the second volcanic phase, two subplinian/phreatoplinian eruptions took place within the lava dome complex, resulting in pumiceous fall and surge suites and pyroclastic flow deposits. Understanding the evolution of the dacitic magmas is crucial to evaluate the possible renewal of the volcanic activity in this region, which presently seems to be quiet. The petrology of the lava dome rocks and the pumices is quite similar. The phenocrysts assemblage comprises hornblendes, plagioclases and biotites. In addition, some lava dome rocks contain clinopyroxenes and olivines, often in crystal clots. Noteworthy, these minerals are magnesian and cannot be in equilibrium with the host melt. Magnesian olivine with Fo content up to 0,91 mol% can be found also in the core of the hornblende phenocrysts. The presence of Mg-rich olivines and clinopyroxenes in the dacites clearly suggests the involvement of a primitive mafic magma in their genesis. Hornblende the most ubiquitous mafic

mineral in the Ciomadul dacites shows various textures. It could have euhedral shape with sharp margin, without any reaction rim (mostly in the pumices), but it could occur also as broken crystals with reaction rims. They show various zoning, such as normal, reverse and oscillatory patterns. It reflects relatively large compositional range, reflected in the Al2O3 (6-14wt%), TiO2 (0.5-2.5wt%) and also in the MgO (10-18wt%) content. Correlation between tetrahedral Al and Ti as well as Na+K suggests amphibole crystallization under various temperatures. The amphibole can be classified into two main groups based on their major and trace element contents. The first group is characterized by high Al, Mg and Ti contents and has typically high Sr and Ba concentrations, whereas the low-T amphiboles have lower values in these elements. Remarkably, these amphibole groups can be often found even in single samples. This feature, suggests mixing of crystal and liquid phases formed at various stages of differentiation. Several amphibole phenocrysts in the lava dome rocks show a sudden increase in Al at the outer narrow margin. This might indicate a reheating event just prior the eruption. The width of the reaction rim of hornblende phenocrysts can be effectively used for evaluating magma ascent during volcanic eruptions. Our calculations show relatively fast ascent of the magmas. In addition, we could observe a slight changing in the ascent rate with time, i.e. during the explosive phase magmas could reach the surface faster than in the former lava-dome building phase. This study is supported by the Hungarian National Research Foundation (OTKA) No. K68587.