

Evolution and water content of the Firiza calc-alkaline basalts, Gutai Mts., North-Eastern Carpathians

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In this work, we studied the Firiza calc-alkaline basalts, which are the final stage of volcanism in the Gutai Mts. Volcanic Zone (Romania) [1, 2]. The main goal was to determine the magmatic water content during the genesis of the basalts. For this, we used the structural hydroxyl content of clinopyroxene phenocrysts applying Fourier Transform Infrared spectrometry (FTIR). We also calculated the equilibrium water contents of the parental melt using the chemical composition and structural hydroxyl content of the clinopyroxene phenocrysts based on the method of [3]. For interpretation of the calculated water contents, we need to understand the evolution of the basaltic melts focusing on the clinopyroxene geochemistry. We have done detailed petrographic observations and SEM-EDS analyses on the selected clinopyroxenes. The core of the studied clinopyroxenes are mainly diopsides and augites and generally show normal chemical zonation. For the FTIR measurements, we used cores of the phenocrysts yielding a structural hydroxyl content of ~100-500 wt. ppm H₂O. These phenocryst cores are assumed to crystallise during the early stages of magmatic evolution; therefore, the water contents acquired from them can represent the water content in the source region of the basaltic melt in the lower crust and upper mantle.

References:

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