



Isotope geochemistry of Late Cretaceous volcanic rocks, Hateg basin, South Carpathians, Romania

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The South Carpathian Mountains are bordered by the foreland sediments of the Moesian Platform to the south and the Transylvanian Depression to the north. Orogen formation started during the Early-Late Cretaceous. The Late Cretaceous magmatic rocks, known as “banatites”, occur in the South Carpathians and Apuseni Mountains mostly as intrusive bodies, sometimes associated with mineralisations. The magmatism is largely calc-alkaline, dominantly by high level granodioritic intrusions. During the Late Cretaceous, besides intrusions, volcanic activity developed in several basins in the South Carpathians, as the Lăpugiu, Poiana Ruscă and Hațeg. In the Poiana Ruscă and Hațeg basins, only volcano-sedimentary deposits have been recognized. In this study Oxygen and Strontium isotopic ratios belonging to Late Cretaceous volcanoclastic deposits of Hațeg basin, South Carpathians are investigated. The data suggest that associated magmas account for assimilation-fractional crystallization trend with $87\text{Sr}/86\text{Sr}$ values between 0.705-0.706 and a large range of oxygen isotopic values up to 16 permil and a trend with higher $87\text{Sr}/86\text{Sr}$ 0.707-0.708, but lower oxygen isotopic values of 8.2-7.9 permil for leucocratic minerals such as plagioclase and sanidine. The Sr-O modelling of the main trend, using mafic minerals (pyroxene and amphibole), show 1-3% source contamination associated with up to 20% crustal assimilation. Hydrogen isotopic composition of amphiboles, biotite and groundmass do not confirm significant involvement of a hydrothermal or diagenetic fluid.