

GARNET ANDESITES FROM THE BÂRGĂU MOUNTAINS, EAST CARPATHIANS, ROMANIA

URECHE, I. & PAPP, D. C. (Geological Institute of Romania, Cluj-Napoca Branch, Cluj-Napoca, Romania)

E-mail: igrcluj@mail.dntcj.ro

Garnet bearing igneous rocks are uncommon worldwide, and consequently limited data are available. The rare occurrences of primary igneous garnets could be explained by the special chemical, p-T and tectonic conditions required for their formation and stability (HARANGI, 1999).

The aim of our study is to bring new data on garnet bearing rocks by a petrological, geochemical and genetical characterisation of the garnet andesites from the Peșii–Mal Neogene intrusive structures from the Bârgău Mountains, East Carpathians.

The Peșii and Mal structures are located at the contact between the Rodna crystalline massif (Rebra series) and Oligocene–Lower Miocene sedimentary rocks, between Sângeorz Băi and Măgura Ilvei localities. Both structures are built up of quartz andesites with hornblende and garnets. They consist of a main intrusive body, tabular in shape, elongated in a NE–SW direction.

The Peșii and Mal intrusive structures represent the only primary igneous garnet bearing outcrops within the volcanic arc of the East Carpathians (NIȚOI *et al.*, 1995). These features lead us in considering the quartz andesites with hornblende and garnets as a special petrographic type.

The quartz andesites show a porphyritic structure, with a fine to medium granular crystalline matrix. Plagioclase feldspars, quartz, hornblende and garnets represent the phenocrysts.

There are small variations in the distribution of major and minor elements. Thus, SiO₂ varies between 58,6–63,7 %, typical values for andesites and quartz andesites. Other mean values are Al₂O₃ = 17.62 %, Fe₂O₃ = 5.32 %, MnO = 0.12 %, MgO = 2.4 %, CaO = 6.21 % and water = 1.86 %.

The garnets (Alm = 46–55 %, Pir = 21–28 %, Andr = 12–15 %) are quantitatively subordinate (1–2 % of the rock volume). They form phenocrysts with subhedral or euhedral morphologies, 0.5–2.5 mm in size. Garnets are fresh, with no inclusions and reaction zones. They are not randomly distributed within the rock mass; most of the garnet crystals form the core of plagioclase and rarely of hornblende megacrystals. The plagioclases hosting garnet crystals are similar to other plagioclases in the rocks, as far as optical and chemical features are concerned, indicating that the feldspars and garnets formed from the same magma. It is also worth mentioning that the garnets are associated only with acidic to intermediate rocks, having corundum in their norm composition. Genetic relationship between garnets and their host rock is thus proved in this way.

References

HARANGI, SZ. (1999). *Topogr. Mineral. Hung.*, VI: 59–85.

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