

ALMANDINE PHENOCRYSTS IN INTRUSIVE ANDESITES FROM THE RODNA MOUNTAINS (SUBVOLCANIC ZONE, EAST CARPATHIANS, ROMANIA)

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In the subvolcanic zone of the East Carpathians, calc-alkaline intrusive magmatism took place during Pannonian–Pontian time span. In this area (Rodna and Bărgău Mountains) many shallow intrusions penetrated either a Precambrian metamorphic basement or a Paleogene sedimentary one. Garnet phenocrysts occur in quartz andesites with hornblende and biotite, always containing normative corundum.

Garnets form subhedral to anhedral inclusion-free phenocrysts (0.5 to 2 mm in size). No significant compositional differences occur between various phenocrysts or between core and rim within the same phenocryst. They have an almandine content slightly above 50% (mole percent), pyrope more than 20%, grossular up to 14% and 7–8% spessartine. The physical parameters (i.e. the refraction index of 1.794 and cell edge of $11.552 + 0.007 \text{ \AA}$) is consistent with the almandine rich composition. Garnet crystals are almost always enclosed in plagioclase phenocrysts.

The garnet bearing plagioclase crystals (3–4 mm in size) are identical in form and composition ($An = 42\text{--}52\%$) with the garnet-free plagioclase. The chemical composition, the occurrence of the garnets only in a few quartz andesite and dacite bodies and their constant association with the plagioclase, indicate a genetic relationship between garnets and their host rocks. The garnets crystallized from intermediate calc-alkaline magmas in an early stage of their evolution. Garnet coexisted with the plagioclase but was resorbed during hornblende crystallization. The magmas were stored in intermediary crustal magmatic chambers, at depths of about 15–20 km (6.43–6.83 kbar), as indicated by Al in hornblende geobarometry.