CONTACT METAMORPHIC PROCESSES ON METAMORPHIC XENOLITHS IN NEOGENE INTRUSIVE BODIES FROM SOUTHERN PART OF RODNA MOUNTAINS (EAST CARPATHIANS, ROMANIA)

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The Rodna Mountains consist of orogenic metamorphic rocks, dynamic metamorphosed rocks (associated to the Pre-Alpine and Alpine shear zones), post-tectonic sedimentary rocks and Neogene intrusive rocks.

The composition of intrusive bodies ranges between dioritic and granodioritic. They are employed in Eocene sedimentary rocks and metamorphics, too. The metamorphic host rocks underwent slight, locally developed transformations under chlorite-, biotite- and garnet zone conditions (greenschist facies) at the contact zone, while xenoliths enclosed in magma suffered higher grade processes.

The main purpose of our research was to decipher the contact and orogenic metamorphic processes in metamorphic xenoliths and to establish their PT-path.

The observed characteristics of metamorphic xenoliths are the followings: the degree of contact metamorphic changes is directly related to the primary composition of xenoliths; the most impressive mineralogical changes have been observed in gneissic and pelitic xenoliths; zonal changes in gneissic xenoliths could be detected (from contact to the inner zone of xenoliths: opaque mineral zone; recrystallized zone: biotite, garnet, feldspar, amphibole; neoblasthesis zone: garnet, staurolite, spinel, andalusite, cordierite, sillimanite ("fibrolite") and chlorite); granoblastic, massive fabrics, disequilibrium testifying reaction coronas around porphyroblasts; relic foliated structures, mimetic overgrowth of relic foliation by neoblastic phyllosilicates and general tendency to obliterate oriented fabrics.

The gneissic relict mineral assemblages were generated in garnet-amphibolite facies conditions (peak conditions) of orogenic metamorphism and retrogression in greenschist facies conditions ($T \sim 400$ °C, $P \sim 2.5$–3 kbar; in MOSONYI, 1992) were suffered. In gneissic xenoliths contact metamorphic transformation and conditions were deduced from mineral reaction coronas and petrogenetic grid: $T_{max} = 400$ °C + $\Delta T/2 \sim 770$ °C and $P \leq 4$ kbar conditions in the opaque zone, while into the central zone of xenoliths the lowered temperatures (530–600 °C) determined recrystallized zone (relic biotite, garnet recrystallization and structural-textural resetting) and newly crystallized mineral zone (cordierite + andalusite + biotite; andalusite + biotite; staurolite + cordierite + andalusite + garnet + hercynite). After these conditions the andalusite → sillimanite ("fibrolite") transformation resulted and due to the temperature decreasing phyllosilicate ("pinite") were formed.