

## **Emplacement of the Solarya Pluton (NW Turkey)**

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The Solarya pluton is one of the major plutons located in NW Anatolia. It consists of three plutonic rock groups: K-feldspar megacrystalline granodiorite (KFMG), microgranite-granodiorite (MGG) and haplogranite (HG). Also mafic dikes and mafic microgranular enclaves (MME) are common within the plutonic body. The northern and southern parts of the pluton present different textural properties. At the northern part of the pluton, K-feldspar megacrystalline granodiorite with porphyritic texture is dominant while southern part of the pluton is formed from microgranite-granodiorite with microgranular texture. Haplogranite, which is typical with its graphic/granophyric texture, outcrops between KFMG and country rocks as a thin aureole.

The emplacement of the Solarya pluton began forcefully at the deeper levels of the epizone and then reached to shallow levels in the crust. The northern and southern part of the pluton displays textural and structural indicators of this different emplacement levels. At the northern part, between KFMG and the country rocks, pluton developed a narrow contact metamorphic zone characterized by the hornblend-hornfels facies. Additively, through the northern and eastern margin, the structural properties of the regional metamorphic rocks have changed depending on the emplacement of pluton indicating a forceful emplacement. The basement rocks at the southern boundary represent a “roof pendant” on the MGG. In some places of southern margin, MGG gradually passes into the subvolcanic rocks (microgranodiorite-quartzdiorite porphyries) which were emplaced into the ring and radial faults connected to pluton emplacement.

The amphibole-plagioclase geothermobarometer results of Solarya pluton indicate that, for MGG 0.8-1.0 kb and 626-678 C and for K-feldspar megacrystalline granodiorite 1.8-2.3 kbar and 737-752 C pressure and temperature emplacement conditions are calculated. This data suggest that while the southern part of the pluton were emplaced into shallow levels in crust (<2.4-3km) the northern part represents the deeper parts of the epizone (6-7 km). When all of these data evaluated together, the Solarya pluton was emplaced into the regional metamorphic rocks forcefully at the deeper levels of epizone and then reached to shallow levels in the crust via cauldron subsidence and passive emplacement mechanisms as a consequence of post-collisional extension.