

Geochemical, geochronological and isotopic data from Permo-Triassic plutons in Western Pontides, NW Turkey

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Permo-Triassic magmatic rocks can be observed different tectonic terrains and continental blocks in the Mediterranean region. The İstanbul and Istranca (Strandja) zones are two different continental blocks, which are located in the western part of the Pontides in northwest Turkey. Whole-rock major and trace elements, zircon U–Pb dating and Sr–Nd isotope data are reported for the Kırklareli metagranites (KMG), Tepecik cataclastik granite (TCG) in the Istranca zone and Sancaktepe granite (STG) in the İstanbul zone, in order to interpret their petrogenesis, time of emplacement and geodynamic implications. Zircon U–Pb dating yields an age of 268.3 ± 2.1 Ma for the KMG and an age of 249.4 ± 1.5 Ma for the TCG. STG also intruded into the İstanbul Paleozoic sequences. Zircon U–Pb dating yield ages of 257.3 ± 1.5 to 253.7 ± 1.75 Ma for the STG.

KMG and TCG intruded into the metamorphic basement rocks of Istranca massif and characterized by high K-calc-alkaline to shoshonitic, mainly peraluminous and slightly metaluminous granitoids. The ASI values are between 0.9 – 1.3 and they have I- and S-type character. $^{87}\text{Sr}/^{86}\text{Sr}$ values for the KMG, the TCG and the STG plutons range between 0.692601 and 0.707640. Initial $^{143}\text{Nd}/^{144}\text{Nd}$ ratios calculated for crystallization ages are between 0.512050 and 0.512431, and ϵNd values vary from -4.69 to 2.22. Nd TDM model ages range between 0.91 and 1.41 Ga. These plutons are enriched in LILEs and LREE and depleted in HFSEs with negative Eu anomalies, indicating that the melts were derived from an enriched mantle modified by crust derived melts. The petrogenetic constraints of the plutonic rocks indicated by these values, suggest that the influence of magma sources varied with time from predominantly crustal to mantle like. In accord with the regional tectonic models, the mid Permian (Guadalupian) rocks were generated in a subduction-related magmatic arc which varied towards a rift-related environment in the latest Permian and Early Triassic.