

Recycled gabbro signature in Upper Cretaceous Magma within Strandja Massif: NW Turkey

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Basic magma intrusions within plate interiors upwelling mantle plumes have chemical signatures that are distinct from mid-ocean ridge magmas. When a basic magma interact with continental crust or with the felsic magma, the compositions of both magma changes, but there is no consensus as to how this interaction occurs. Here we analyse the mineral behavior and trace element signature of gabbroic rocks of the samples collected from the Strandja Massif. Srednogorie magmatic arc is a part of Apuseni- Banat-Timok-Srednogorie magmatic belt and formed by subduction and closure of the Tethys Ocean during Upper Cretaceous times. Upper Cretaceous magmatic rocks cutting Strandja Massif in NW Turkey belong to eastern edge of Srednogorie Magmatic arc. Upper Cretaceous magmatic rocks divided into four subgroup in Turkey part of Strandja massif: (I) granitic rocks, (II) monzonitic rock, (III) syenitic rocks and (IV) gabbroic rocks. Gabbroic rocks outcropped around study area in phaneritic - equigranular texture. According to mineralogic – petrographic studies gabbros have mainly holocrystalline texture and ophitic to subophitic texture composed of plagioclase, amphibole, pyroxene, and rarely olivine and opaque minerals. Also because of special conditions there have been pegmatitic texture on mafic minerals with euhedral form up to 3 cm in size and orbicular texture which reach 15cm in size and rounded – elliptical form. Confocal Raman Spectroscopy studies reveals that plagioclase are ranging in composition from labradorite to bytownite, the pyroxene are ranging in composition from diopside to augite acting with uralitization processes and the olivine are generally in the composition of forsterite. Petrographic and mineralogical determination reveals some metasomatic magmatic epidote presence. Confocal Raman Spectroscopy studies on anhydrous minerals within gabbroic rocks shows affect of hydrous process because of magma mixing. The gabbroic rocks have tholeiitic and changed towards calcalkaline in character. Geochemical features include moderate to slightly elevated large ion lithophile elements (LILE) and slightly depleted high field strength element (HFSE) in patterns. According to petrographic, mineralogical and geochemical studies gabbroic rocks are products of mantle products with contaminated by crustal components and during magmatic activity mantle addition continuing with varying proportions during cycling of magma intrusion in the Strandja Massif.