



Latest Mesozoic-Early Cenozoic Continental Extension and Related Alkaline Magmatism in Central Anatolia, Turkey

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The Central Anatolian crystalline complex (CACC) in Turkey includes a suite of latest Mesozoic-early Cenozoic plutonic rocks intruding the metamorphic and ophiolitic basement rocks. The intrusive rocks consist of three groups of granitoid, syenitoid, and gabbroids plutons. The granitoid units occur around the periphery of the CACC as large plutonic bodies, whereas the syenitoid assemblages crop out in the inner part of the CACC as small plutons. All the felsic plutons are crosscut by the gabbroid rocks in the region. The alkaline rocks of the CACC change in composition from nordmarkite through pulaskite to lusitanite, and are made of silica-saturated and silica-undersaturated magmas. The silica under-saturated alkaline rocks have gradual contacts with the silica-saturated alkaline rocks and constitute the main component of the alkaline rocks in the CACC. Nepheline, pseudoleucite, cancrinite, nosean, melanite and arfvedsonite are the main typical mineral compositions of the silica-undersaturated alkaline rocks. The leucite- and pseudoleucite-bearing rocks have porphyritic textures intruding the other main subunits of the alkaline rocks at high topographic elevations in the region. They are mostly composed of foid syenite, monzosyenite, monzodiorite and include rare amount of monzogabbro and foidolite. Each subunit has a transitional contact with the others and is crosscut by alkali feldspar foid syenite veins. Felsic dykes intrude the alkaline rock units and fluorite-bearing hydrothermal veins, which manifest themselves as alteration zones.

The alkaline rocks have an abundance of xenolithic enclaves but lack any magma mixing-mingling produced enclaves. Normalized elemental patterns of the analyzed alkaline rocks show a slight enrichment in large ion lithophile elements (LILE) and light rare earth elements relatively to high field strength elements (HFSE) and heavy rare earth elements (HREE). The less fluid mobile, LILE and LREE concentration in the alkaline rocks represents the magmas derived from a subduction-metasomatized lithospheric mantle that were intruded into the lower crust. This tectonomagmatic evolution of the alkaline units in the CACC were part of and may have largely contributed to the latest Mesozoic-early Cenozoic extension of the CACC, as in an Andean-type, incipient continental back arc basin opening.