International Conference

Neogene Magmatism
of the Central Aegean
and Adjacent Areas

Petrology, Tectonics, Geodynamics, Mineral Resources and Environment

11 – 13 September 2006, Milos island, Greece

BOOK OF ABSTRACTS

Milos Conference Center – George Eliopoulos
PETROLOGY AND GEODYNAMICS: FINDINGS FROM AEGEAN AND ADJOINING REGIONS

G. POLI¹, D. PERUGINI¹, M. PETRELLI¹, A. KORONEOS², T. SOLDATOS², G. CHRISTOFIDES², G. ELEFTERIADIS²

¹University of Perugia, Italy
²Aristotle University of Thessaloniki, Greece

Subduction-related mantle derived melts in the Aegean and adjoining regions commonly display large compositional variations. Information about metasomatic events that may have occurred in the mantle wedge can be achieved by focusing on mafic products cropping out in northern Greece, as Tertiary intrusive and effusive rocks, by considering geochemical variations of both major and incompatible trace elements. Results show that mafic melts range from calc-alkaline, to shoshonitic, up to ultrapotassic indicating the coeval occurrence of mantle derived melts with strongly different enrichment in incompatible elements. Two mantle sources have been considered as end-members occurring in a mantle wedge able to generate melts spanning all intermediate compositions. The first end-member may be represented by a strongly metasomatized mantle source where K-rich phases, such as phlogopite, played a key role. The low Al, Na, Ca, and the high compatible element abundances of magmas argue for a restitic peridotitic source. The second mantle end-member may be regarded as a fertile metasomatized therozolitic source the partial melting of which may have generated mafic melts with higher Al, Na, Ca, and lower compatible elements. Comparison with the younger magmatism in southern Aegean regions shows that ultrapotassic mafic magmas are lacking, and the amount of mafic melts with shoshonitic affinity diminishes from North to South. Differences in type and amount of magmatism can be attributed to the complex geodynamical evolution of the area. In particular, it is suggested that two subduction events metasomatized the same mantle wedge from Late Triassic-Early Jurassic to Tertiary. Partial melting of this mantle wedge originated the compositional diversity of mafic magmas cropping out in northern Greece. On the contrary only the present day subduction is metasomatizing the mantle wedge, whose partial melting originates mafic magmas across the South Aegean Arc displaying a lower degree of compositional diversity.