

## PETROLOGY AND GEOCHEMISTRY OF TERTIARY VOLCANIC ROCKS OF ESSIMI - KIRKI, EASTERN RHODOPE

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The volcanic activity in the tertiary volcanosedimentary basin of Essimi-Kirki area is mainly consisting of andesites and dacites but also occurrences of basalts and rhyolites are present as well. These volcanic rocks have been found in the form of lavas and intrusions into a subaqueous environment. The most of these volcanics have a porphyritic texture with phenocrysts of basic plagioclase, hornblende, biotite and pyroxenes. These calc-alkaline volcanites are characterized by high values of  $K_2O$ ,  $K_2O/Na_2O$ , Rb, Sr, Zr and low  $TiO_2$  and FeOt. An interpretation of the known data for these volcanites suggests that they are erupted in an orogenic environment of Andean type.

## WOLLASTONITE AND ASSOCIATED COPPER MINERALIZATION IN THE CONTACT METAMORPHIC AUREOLE OF KIMMERIA, XANTHI, N. GREECE

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Wollastonite, usually associated with copper minerals, appears in the contact metamorphic aureole of Kimmeria, near Xanthi, and is genetically related to the Xanthi plutonite. The mineral assemblages: (a) wollastonite  $\pm$  garnet (andradite)  $\pm$  clinopyroxene (diopside)  $\pm$  scheelite  $\pm$  chalcopyrite - bornite  $\pm$  chalcocite  $\pm$  aikinite and (b) wollastonite  $\pm$  garnet (andradite)  $\pm$  clinopyroxene (diopside)  $\pm$  calcite  $\pm$  quartz  $\pm$  epidote  $\pm$  hematite (specularite) were found. In the mineral assemblage (b) quartz, calcite, epidote and hematite are retrograde minerals formed at the latest skarn stage. Coexistence of chalcopyrite-bornite with wollastonite-andradite indicate moderate relative  $fO_2$  and  $fS_2$  conditions, as evidenced by the reaction:  $chalcopyrite + wollastonite + O_2 = bornite + andradite + S_2$ . During continuous cooling, an evolution of the chemistry and of the oxidation state of the metasomatic fluids is confirmed by the growth of chalcocite rims around bornite and by the formation of epidote and hematite as retrograde minerals. A zonal pattern is recognized in the contact metamorphic aureole of Kimmeria, with andradite-rich skarns and associated magnetite-pyrrhotite-chalcopyrite  $\pm$  Fe-rich sphalerite, close to the intrusive contact and with chalcopyrite-bornite associated with wollastonite, outwards.