te comes from the Cyclade Islands Milos and Kimolos. There we know of about 10 differe technical varieties, of which the best are autochthonous types originating by hydrotherm alteration but altered halmyrolytically by Quaternary transgression.

NEOFORMATION OF MINERALS AND GEOCHEMICAL CHARACTERISTICS OF PLIOCENE LAYERS OF AGIOS THOMAS, AEGINA ISLAND, GREECE

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In the NE part of the Aegina Island in the area of Agios Thomas – Alones siliceou sediments of Lower Pliocene (4.4 ± 0.2 m.y.) in age occur. These sedimentary rocks co tain biogenic opal (opal-A) and authigenic opal (opal-CT). Opal-CT has been derived fro diagenetic transformation of formerly biogenic sediment enriched in diatom frustules, spo ge spicules and radiolarian tests. Both opal-A and opal-CT-rich sedimentary rocks are inte bedded and covered by volcanic breccia. The diagenesis was taken place in shallow buri depths and primarily controlled by high heat flow in the region from the Pliocene up to Hol cene.

Besides the mineralogical conversion, a change in major and trace element concentra tion encountered during diagenesis. So, with the exception of silica, the content of all th other major, and trace elements present a depletion from the diatomaceous rocks to porc lanites (opal-CT-rich strata). Generally, the distribution of all the elements analysed depend on the mineralogical composition of the rock. Especially, boron values in diatom-rich laye are characteristic for marine depositional environment with normal salinity-alkalinity.

Finally, the transformation of opal-A to opal-CT is an unusual phenomenon in suc young sedimentary rocks, which were not deeply buried.

FE-CR-SPINELS AND ILMENITE MINERALIZATION IN THE METAMORPHOSED ULTRAMAFIC ROCKS OF ASKOS AREA, THESSALONIKI DISTRICT, N. GREECE

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The development of Fe-Cr-spinels and Fe-Ti-oxide mineralization in the ultramafi rocks of Askos area Serbo-Macedonian massif, during regional metamorphism is studie The meta-ultramafics are massive to sheared serpentinites consisting of coarse fibr

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lamellar fringes of antigorite and local concentrations of talc, chlorite and tremolite. Extensive metasomatic reaction zones of chlorite-, talc-, tremolite- and vermiculite-rich rocks have been developed between the contacts of the meta-ultramafic bodies and the country metamorphic rocks.

The Fe-Cr-Ti-oxides mineralization forms thin bands, stringers or massive stocks and nodular bodies within a silicate matrix of antigorite ± chlorite ± talc ± tremolite. Fe-Cr-spinels exhibit usually an optical zonation and consist of a chromite core, ferritchromite intermediate zones and magnetite rims. Magnetite forms also discrete crystals, polygonal granoblastic aggregations and megacrysts up to 5 cm. Magnetite from weathered outcrops shows supergene alteration to specular hematite and/or goethite.

Chromite cores and ferritchromite zones have a composition of aluminian chromite and ferrian-chromite to chromian magnetite respectively, with high MnO contents (2.47-4.25%). Magnetite rims have high Cr_2O_3-content (14.58-7.80%) gradually decreasing outwards to the margins, while the NiO-content (0.30-0.95%) shows usually en opposite trend.

Fe-Ti-oxides are represented by a solid solution series of Fe-Mn-Mg-ilmenites forming either discrete grains or fillings in the interstitial sites of the Fe-Cr-spinel crystals.

In co-existing pairs of magnetite and ilmenite a preferential enrichment of ilmenite in Mn, Mg and magnetite in Cr, Ni was recognized.

Fe-Cr-spinels are considered as the result of a multistage metasomatic process on primary chromite enclosed in the ultramafic protolith. This process started during the serpentinization when secondary magnetite is formed, and advanced to the present state by the regional metamorphism overprint. Chromite was transformed to ferritchromite in an early stage and finally to Cr-bearing magnetite in the zoned crystals. During this transformation Mg, Al, Cr and Mn diffuse out of the chromite, while Fe and Ni ions diffuse in. The released elements Mg, Al, Cr were fixed in serpentine which was transformed to chlorite. Manganese was fixed in ilmenite which is considered as the metamorphic product of a primary Ti-bearing mineral phase.

The mineral assemblages in the meta-ultramafics denote that these rocks have suffered a metamorphism of upper greenschist to lower amphibolite facies.

The chemical inhomogeneity of the zoned Fe-Cr-spinels is explained by the incomplete equilibration of primary chromite and secondary magnetite during the metamorphic recrystallization.

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