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## **PIEMONTITE AND ASSOCIATED MINERALS FROM SUDETEN MOUNTAINS (POLAND) AND EUBOEA ISLAND (GREECE)**

Peculiar parageneses of piemontite with Mn-rich minerals such as tourmaline, titanhematite and/or ferriphengite, garnet have been found in pegmatoidal segregations in gneiss-amphibolite complex (Marcinków Sudeten Mts.) and in epizonal crystalline schists (Treppes, Euboea Isl.) respectively. Associated minerals list embraces besides : epidote, Mg-chlorite, titanite, apatite, phlogopite, quartz and alkali feldspars. The succession of the most significant minerals was established as follows : tourmaline, epidote, piemontite, phlogopite, alurgite spessartitic garnet titanhematite and Mg-chlorite. Postmagmatic waters contaminated by the products of oxidation reactions during metamorphism of country rocks were the chief factors of piemontite-bearing parageneses origin.

MARIA KULIG

## **CHALCOPHANITE FROM THE SILESIAN-CRACOVIAN Zn-Pb DEPOSITS**

Chalcophanite was identified in museum samples of Mn oxide minerals derived from the weathering zone of the Silesian-Cracovian Zn-Pb deposits and labelled in the collection as psilomelane, wad and pyrolusite. This mineral was also found in a chocolate-brown substance, occurring in dolomite and galmei fissures in the mines of Dąbrówka Wielka and Olkusz. Hydrohetaerolite and an accompanying Mn-Pb oxide mineral had been identified earlier in a similar substance from these deposits. The identification of chalcophanite was based on X-ray powder patterns (the strongest lines: 6.91, 3.46, 2.556, 2.455, 2.228 Å) and microscopic examinations in reflected light. Reflectance (R %) of chalcophanite in air is: for white light  $R = 30.0-10.5$ , for green light  $R = 28.1-9.6$ . The results of thermal and infra-red spectrophotometric analyses of all the samples containing chalcophanite are presented. It has been found that upon heating, chalcophanite is gradually transformed into hydrohetaerolite and then into hetaerolite.

WŁODZIMIERZ PARACHONIAK, JAN ŚRODOŃ

## **THE FORMATION OF KAOLINITE, MONTMORILLONITE AND MIXED-LAYER MONTMORILLONITE-ILLITES DURING THE ALTERATION OF CARBONIFEROUS TUFF (THE UPPER SILESIAN COAL BASIN)**

Mineralogical studies were carried out on the unique profile of an intercalation in a coal-seam (Westphalian A/B - the Upper Silesian Coal Basin), showing in a 1 m thick layer a

continuous vertical gradation from pseudomorphosen tonstein to bentonite. Non-clay minerals are identical throughout the layer, testifying to the pyroclastic character of the primary material (sanidine, high-temperature plagioclase, biotite, quartz with the uniform extinction, apatite). Sedimentological observations demonstrated in situ alteration of this material. Vegetation affected the relative intensity of montmorillonite and the consequent kaolinite formation. During the latter process, the transformation of biotite structure led to the formation of D-kaolinite, whereas crystallization from the solution produced T-kaolinite. The montmorillonitoids show variation from pure dioctahedral montmorillonite, through random and partly ordered mixed-layer montmorillonite-illites (10-50% I), to those of allevardite type, characterized by maximum ordering of their structure. A hypothesis has been put forward on the mixed-layers having formed from montmorillonite as a result of sorption of potassium released during the kaolinization of tuff.

MARIA HUBICKA - PTASIŃSKA

**Fe-Ti OXIDE MINERALS IN ANDESITE FROM THE WŻAR MOUNTAIN  
(PIENINY MTS.)**

Two generations of the Fe-Ti oxide minerals have been found in the younger variety of andesite from Wżar. One generation is made up of large, corroded titanomagnetite phenocrysts a part of them being homogeneous, the other one containing inclusions of a different spinel phase. Chemical examinations have demonstrated that these are titanomagnetite inclusions. A chemical analysis performed on electron microprobe X-ray analyser has shown the complexity of maghemlitization process which is not a simple oxidation of  $Fe^{2+}$  to  $Fe^{3+}$  but is connected with the anisotropic diffusion of cations. The untypical process of oxidation of some titanomagnetite grains only to titanomagnetite is very likely a consequence of magmatic assimilation of limestones. The second generation of Fe-Ti oxide minerals consists of idiomorphic, homogeneous very fine (below 0,05 mm) titanomagnetite grains scattered in the groundmass.

WOJCIECH NARĘBSKI ANDRZEJ PAULO

**SOLFATARIC ALTERATION PRODUCTS OF ANDESITIC LAVAS IN THE  
CRATER OF COTOPAXI VOLCANO, ECUADOR**

The paper deals with the results of geochemical-mineralogical study of alteration products of andesitic lavas by solfataras, active in the crater of Cotopaxi volcano. Final products, occurring at solfatara vent, are *opalites*, consisting of opal-cristobalite with sulphur admixture and trace amounts of alunite and barite. Alunitized andesites are less altered rocks in which relict primary components are accompanied by secondary opal-cristobalite, alunite and traces of gypsum. Sulphur, opal-cristobalite, gypsum and alunite occur as incrustations or fissure fillings in surrounding rock. Distribution and behaviour of major and minor elements and conditions governing various solfataric alteration processes are discussed.

WIESŁAW HEFLIK, WŁODZIMIERZ PARACHONIAK

**MINERALOGY OF FULGURITE FROM PUSTYNIA BŁĘDOWSKA NEAR  
OLKUSZ**

Mineralogical examinations have shown that fulgurite occurring within Pustynia Błędowska in south Poland consists of relict quartz, quartz glass (lechatelierite) and low cristobalite.