

4. In the all regions of study the earthquakes in the first seismogenic layer are with the highest magnitude. In the Jambol region the maximal magnitude decreases relatively slowly in the second, third and forth layers. In the Plovdiv-Chirpan and Chlef-Tenes regions the decrease of the maximal magnitude in the second and third layers is sharper.

The highest energetic potential of the first seismogenic layer is related with the significant problems of the seismic environmental geology in the three regions.

## **TERTIARY PLUTONIC ROCKS FROM EAST RHODOPE IN BULGARIA AND GREECE**

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The East Rhodope is characterized by an intensive Tertiary orogenic activity manifested by both plutonic and volcanic magmatism. The plutonic rocks of two areas from the East Rhodope, one from Bulgaria and one from Greece, namely the Zvezdel and Leptokarya-Kirki intrusions, are studied and compared.

The magmatism in both areas is strongly controlled by tectonic activity. The distribution of the various intrusions is related to deep faults of mostly NE-SW and S-N direction. The Zvezdel plutonics comprise rocks ranging in composition from monzogabbro to tonalite through qz-gabbro, qz-monzogabbro/qz-monzodiorite and qz-monzonite. They are medium-grained with monzonitic to ophitic and porphyritic textures. Their modal composition is plagioclase, K-feldspar, quartz, ortho- and clinopyroxene. Less abundant is biotite and olivine. The Leptokarya-Kirki intrusions are classified as qz-gabbro, qz-diorite, qz-monzogabbro/qz-monzodiorite, tonalite and granodiorite. Their mineralogical composition is plagioclase, K-feldspar, quartz, ortho- and clinopyroxene biotite and hornblende.

The Zvezdel rocks have characteristics of the high-K calcalkaline to shoshonitic series while those of Leptokarya-Kirki of the calc-alkaline to high-K calc-alkaline series. An overall increase of potassium towards Zvezdel is obvious. Chondrite-normalized REE patterns are similar in both areas except HREE which are almost unfractionated in Zvezdel. SREE is lower in Leptokarya Kirki. Discrimination diagrams used show a volcanic arc granites setting for the Zvezdel and Leptokarya-Kirki rocks.

Major, trace and REE abundances along with the presence of cumulitic phases

support an evolution of the rocks by fractional crystallization. The relatively flat HREE patterns and the enrichment in LREE and other LILE are compatible with an "enriched" upper mantle source region. The evolution of the rocks is related to the subduction of the African plate under the European plate. Partial melts and/or hydrous fluids contributed to the enrichment of the mantle during the process of the subduction.

## **FRAMBOIDAL PYRITE IN THE Fe-Cu-(Zn-Pb-Au) DEPOSITS OF THE XYLAGANI AREA, RHODOPE COUNTY (THRACE).**

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Research carried out in the Metavolcanosedimentary Series of Xylagani area (Thrace) revealed the presence of framboidal pyrite. This special form of pyrite is found in the chlorite schists of the Metavolcanosedimentary Series coexisting with pyrite, chalcopyrite, limonite, covellite, chalcocite, sphalerite, tetrahedrite, galena, pyrrhotite and gold. The framboids are spherical in form and their size ranges from 4 to 37.5  $\mu\text{m}$ . The dominant size of the constituent pyrite microcrysts is less than 2  $\mu\text{m}$ .

The studied framboids are found within silica material and usually appear as individuals and to a lesser extent as colonies. The presence of framboidal clusters, dispersed framboids and clouds of single pyrite microcrysts is also observed. More than 70% of the framboids of the Xylagani area are tightly-packed resulting in an almost homogeneous mass. The homogenisation is observed at the core and extends towards the periphery of the framboids and in most cases has obliterated the internal structure of the constituent pyrite microcrysts. However, on rare occasions a concentric structure may be distinguished.

The formation of the studied pyrite framboids is attributed to the interaction of  $\text{H}_2\text{S}$  with Fe, both of them being of volcanic origin. The framboids are interpreted as early diagenetic formation and they were formed under reduction conditions with neutral to alkaline pH values. Silica material plays a key role in their preservation protecting them from dispersion, recrystallization and deformation.

The homogenisation that has been observed in the framboids is attributed either to a later addition of new pyrite in an infilling process or to recrystallization.