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COMPARATIVE SPECTROSCOPIC STUDY OF CARBONATE ROCKS FROM WESTERN MACEDONIA IN GREECE

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Naturally occurring carbonate rocks are extremely important natural resources finding widespread applications (TULYAGANOV et al., 2002; MA et al., 2000), thus being placed among the most important raw materials and their study is the subject of the work of many researchers (DEER et al., 1992). Samples were collected from the broader Kozani area (northwestern Macedonia, Greece), which geotectonically belongs to the Pelagonian zone. The Pelagonian zone consists of a crystalline pre-Carboniferous basement, which includes a series of metamorphic rocks intruded by large masses of Upper Carboniferous granites. The samples in powder form, with major components in different proportions of calcite $CaCO_3$, the most stable phase of calcium carbonate, and dolomite $CaMg(CO_3)_2$ were studied, aiming in the determination of the calcite/dolomite ratio. Other minerals (quartz, feldspars, micas, etc.) were participating in minor quantities in their mineralogical composition. The samples were also analyzed by XRD and other methods. The particle size was the same for all studied samples.
For the quantitative characterization, a FTIR based method is used (ZORBA 2003, 2004). FTIR spectroscopy is an established experimental technique for qualitative mineral identification (McMILLAN & HOFMEISTER, 1988; WHITE, 1974) and is also being developed for quantitative mineralogy. FTIR relies on the detection of vibrational modes and mineral identification is possible because minerals have characteristic absorption bands in the mid infrared.
In the present study the qualitative determination is based on the frequency shifts in the vibrational frequencies of functional groups due to chemical composition and the quantitative analysis of mineral sample is extracted from the FTIR spectrum through the use of appropriate peak analysis software employed for the calculation of the constituents' ratio. Comparison of the results with those received from XRD leads to the examination of the accuracy of the method used.

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