

Tourmalines are a complex group of minerals that includes currently 41 species approved by the International Mineralogical Association - Commission On New Minerals, Nomenclature And Classification (IMA-CNMNC). In Poland, tourmalines occur mainly within the Sudetes and Tatra Mts. Long-standing research on tourmalines from various geotectonic environments as well as their synthetic equivalents revealed processes that control ion substitutions related to the chemical compositions of those minerals; it enabled establishing a substantive background to use tourmalines as valuable petrogenetic indicators.

Detailed mineralogical investigations of tourmalines from the Kowary-Czarnów unit may become a tool for determination of both their pre-metamorphic protoliths slightly diversified within various areas of this unit and the description of metamorphic processes that are responsible for the final composition of these tourmalines. Tourmalines from the Kowary-Czarnów unit feature zonal texture, which can reflect their crystallization connected with metasomatism of the primary sedimentary-volcanic protoliths. Previous researches of regional geology of the unit indicated similar composition of tourmalines within various areas of the unit, what may reflect MP-MT Variscan regional metamorphism of compositionally similar protoliths as well as influence of contact metamorphism related to the Karkonosze granite intrusion.

Implementation of the project requires field works within the Kowary-Czarnów unit in order to collect rock samples including tourmalines as accessory minerals. The following phase shall be based on modern laboratory testing with the utilization of chemical analyses through application of WDS electron microprobe that is a key technique for non-homogeneous zonal crystals. Local chemical analyses and profiles will determine trends related to evolution of elemental composition and, indirectly, make conclusions on structural changes associated the substitutions. Raman spectroscopy shall be applied as a support for WDS method. Considering elaborated conversion procedure for chemical composition in view of non-homogeneous zonal sample, Raman spectroscopy is highly valuable.

Results of the project may be useful to interpret protoliths as sources of the elements utilized to the tourmaline formation during multi-phase metamorphism of the Kowary-Czarnów unit. This work may provide some additional information related to evolution of the Kowary-Czarnów unit, as well as support the determination of tourmaline formation mechanism within specific metamorphic conditions. It simultaneously may cause broadening knowledge related to tourmalines as metamorphic process indicators.