

MICRORAMAN SPECTROSCOPY OF SOLID INCLUSIONS IN MINERALS OF METAMORPHIC ROCKS (LAPLAND GRANULITE BELT, KOLA PENINSULA, RUSSIA).

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Micro-Raman spectroscopy is an efficient method of investigating natural and synthetic materials at a microscale (objects about 5 micron in size). Among other advantages are the non-destructive character of this method and the opportunity to use ordinary thin sections of rocks prepared for petrological and mineralogical studies. It has been for the first time applied to solid microinclusions in minerals of metamorphic rocks from the Lapland Granulite Belt, as they offer valuable mineralogical and genetic information. Optical and microprobe studies of garnets and zircons revealed numerous microinclusions of different morphology, physical properties and chemical composition. To fulfil complete mineralogical diagnostics we needed data about structural state of substances. For this aim, the micro-Raman investigations were performed with Renishaw Raman spectrometer (He-Ne red laser). We have obtained information about different microminerals (almost 20 species) in highly metamorphosed rocks. Some of the results are given below:- all SiO₂ inclusions are α-quartz, even though they differ in luminescence colors – blue, orange etc. This information is available only with Raman spectrometry;- Raman spectroscopy and microprobe analyses showed the presence of apatite microminerals with high Cl and low OH-. Such chemical composition of apatite is uncommon for Kola Peninsula rocks and was revealed for the first time;- not only monomineral, but also multiphase inclusions have been revealed and studied. Among them there are proto-, syn- and postgenetic. Some proto- and syngenetic inclusions contain xenogenous substance. These facts suggest a supracrustal or intrusive nature of the granulite protoliths.