



## MINERALOGY AND PETROGRAPHY LABORATORY

Mineralogical and Petrographical investigations; produce essential information of the mine plants, plant design, developing of the production processes and quality control studies on use of natural mineral resources in industrial terms.

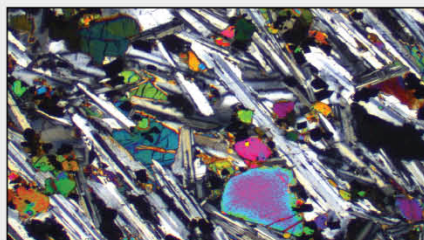


The basis of these investigations based on the identification of natural rock forming minerals and the naming of the rocks depending on the minerals.

Minerals are identified both qualitatively and quantitatively by using different methods and equipments. The relative relationships of minerals and textural properties of minerals and rocks are determined and all rock samples classified according to international classification systematics and standards.



Polarizing Microscope



Mineralogy and Petrography Laboratory has well educated technical staff and well equipped with brand new instruments to provide the following analysis; optical microscopy, X-ray diffraction (XRD), coal petrography, fluid inclusion, scanning electron microscopy (SEM), mineral liberation (MLA) and fourier transform infrared spectroscopy (FT-IR).

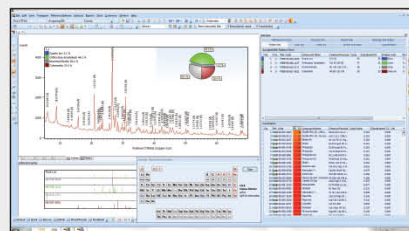
### Petrographical Analysis

Thin sections of the rock samples and polished sections of the metallic minerals prepared and carried out the optical microscopy analysis under microscope. Also MOHS hardness values of the rocks are determined.

Natural marble and natural stone products to be used as a building material that is required to receive CE Certificate are analysed according to TS-EN 12407 standard.

### XRD Analysis

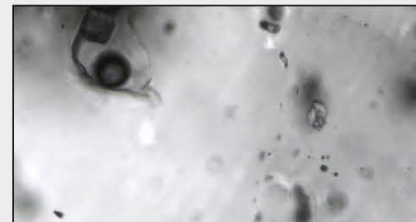
Mineralogical composition of powdered samples are determined by qualitative XRD and qualitative XRD clay analysis, and quantitative XRD analysis are carried out using Rietveld refinement method. Also examination of kidney stones are made by XRD method.



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### Coal Petrography Analysis

Descriptions of coal, oil, asphaltite, asphalt, petroleum coke and ozokerite are made, contents and degrees of maturity of organic materials are determined. Measurement of reflections ( $R_{max}$ ,  $R_{rand}$ ,  $R_{min}$ ,  $R_{mean}$ ) of organic substances are carried out.

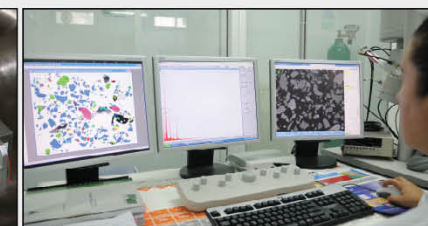


### Fluid Inclusion Analysis

Fluid inclusion studies are carried out to get information about the initial crystallization temperature of a mineral and the salinity of solutions from which a mineral crystallized.

### SEM Analysis

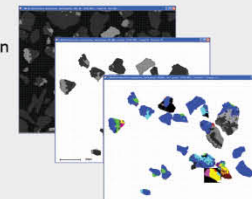
With the SEM technique morphological, structural and elemental informations are retrieved, in addition X-ray elemental mapping (X-raymapping) and standardless qualitative elemental analysis (SEM-EDS) is performed.



SEM Device

### MLA Analysis

Distribution of ore minerals, grain sizes, mineral associations, liberation and locking in the enriched samples are determined by automated MLA system.



FT-IR Device

### FT-IR Analysis

With FT-IR technique, the structure of organic or inorganic solids are qualitatively analyzed in mid-infrared region by two different methods; powdered sample is directly analyzed by using the ATR or powdered sample mixed with Kbr is pressed in the form of 13 mm pellets can be analyzed.

### Sample Preparation

Well equipped with new sample preparation instruments are used for preparing all kind of samples for the division. Thin sections and polished sections.

- Moulding and polishing
- Crushing-grinding.
- Pressed samples.
- Carbon and gold coating.

