

Results of the demonstration of the MEEP analyser in Orsay with BRGM and Zeiss representatives

On the 7th of March 2011, Representatives from the Mineral Resources Service of the BRGM (Bureau of Geological and Mining Research) and the director of the microscopy systems division of Carl Zeiss France together with a sales-engineer came to see a demonstration of our Micro-LIBS analyzer called "MEEP" within IVEA.

The elemental analysis by LIBS can answer to different needs of the BRGM :

- To get an 'identity card' of minerals that would determine their geographical origin (trace minerals). Quantification of trace elements in conventional sulfide phases for rebuilding of mineralizing systems or to estimate their value.
- To detect light elements such as lithium (conventional spatially resolved analytical techniques can't detect this light element)
- To Study the fixation of trace elements in coals



The main advantages of using the MEEP for these applications are:

- A fast analysis
- The possibility to detect all the elements with one system and in one analysis
- The spatial resolution which can be better than 10 μ m
- The possibility to do quantitative measurements
- To sort out the materials with PCA techniques.

In less than two hours, we conducted qualitative analysis on four samples brought by the representatives of BRGM. In the first approach, with very little optimization of the parameters, we were able to analyze:

- A sphalerite included in resin: detection of the presence of iron
- A concentration of Cu in tablet form: clear detection of Fe, Cu, Al, Na, Li, Zn, Si, Ba, Ca, C, Cr, possible traces of Zr, Bi, In, Ag that could be confirmed by further analysis
- A coal included in resin: detection of C, Ca, Na and P
- A crystal of spodumene (LiAlSi₂O₆): The Lithium is an easy element to detect in LIBS, the concentration of lithium in the ore was about 8%, so clearly visible

