

# CAMEVA.

Automated system for the microscopic characterisation of metal ores



## Contact information

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## Technological Offers type

Technological solutions

## Research and innovation areas

- Agriculture, Forestry, Natural Resources, Land Use and Blue Growth
- Climate, Energy and Mobility
- Industry, Materials and Circular Economy

## ODS



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### Where?

Mineral Resources

Keywords: | [Artificial Vision](#) | [mining](#)

### Brief description of the technology solution and the added value it provides

The CAMEVA system is based on an optical microscope in reflected light, specially adapted for allowing the acquisition of multispectral reflectance spectrums in the band is visible and near-infrared, associated with a vision system that implements procedures of calibration, acquisition and correction ensuring Imaging in units of absolute reflectance with a perfect record among the different bands. This allows to recognize the metal ores in a sample with high reliability, without the intervention of an expert. It constitutes a breakthrough in the field of the geometallurgy because it provides information comparable or even complementary to the SEM (scanning electron microscopy) systems that are more advanced at a fraction of their cost, faster analysis and environmental requirements and less demanding sample preparation.

### Description of the technological base

The CAMEVA system is based on a specially adapted reflected light microscope that allows the acquisition of multispectral specular reflectance in the visible and near-infrared bands, which are associated to a system of vision that implements some procedures of calibration, acquisition and correction. These ones could guarantee the obtaining of images in units of reflectance absolute with a perfect record between the different bands.

This allows to recognize the metal ores in a sample with high reliability, without the intervention of an expert. It is a breakthrough in the field of the geometallurgy because it provides comparable information to those more advanced scanning electron microscopy systems at a fraction of their cost.

*“Optimize the exploitation of mineral resources, while safeguarding the environment”*

### Market demands

#### Energy

- SEM (scanning electron microscopy) systems that are currently used for the characterization of ores have such a high price and high environmental requirements that they are only available to large mining companies and some universities. This system would have less strict environmental requirements and a lower cost, so it would be possible to use it in a large number of medium or small size companies and universities, even in developing countries. It provides a tool for a systematic quantitative analysis of ores, which would optimize the use of mineral resources, improving energy consumption and decreasing possible harmful effects on the environment.
- There are currently about 300 SEM systems worldwide, and the market is nearly saturated.
- This system estimated price would be three to six times lower than current ones; their market potential should be at least five to ten times higher.

#### ICT

- The proposed system could be adapted to characterize other types of materials characterized by its reflectance or even its transmittance; this broadens its scope of application

*“CAMEVA provides a solution to the characterization of ores in mining companies or universities that are located, for instance, in developing countries”*

### **Competitive advantages**

- Much lower cost than the classical SEM systems (QEMSCAN, MLA).
- Capacity to clearly discriminate minerals of similar composition (for example: iron ores) that are not distinguished by SEM systems.
- Faster analysis.
- Much less restrictive environmental requirements.
- Easier samples preparation.
- Capacity for learning new minerals by the user, without having to make major configuration changes.

### **Previous references**

- Project in collaboration with UPM and AITEMIN.
- Financed by the National Plan of R+D+i of the Ministry of Education and Science (CGL2006\_13688\_C02\_01).
- Prototype of the system in use at the Laboratory of Applied Microscopy and Image Analysis (UPM) for the study of ores from several mines.

### **Intellectual property**

- Patent granted in Spain ES2368321

### **Development stage**

- Concept