

Expert mineralogical investigations using a combined approach

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Quantitative mineralogical and chemical analyses of ores is paramount for an efficient survey and subsequent mining and extraction processes. Another key aspect, considering the large volumes of the samples to be investigated, is the possibility to obtain a complete set of data in a comparatively short time and using on field instrumentation to not move around large samples (e.g., core drills). For this reason, approaches based on flexible techniques, as concerns sample preparation and data acquisition are rather popular in this field, mostly using IR based techniques, X-rays fluorescence and hyperspectral imaging.

However, none of these methods is capable to provide a fully satisfactory response for several reasons, the main one being the complexity of the ores.

Multianalytical approaches are in the end needed, to be conducted in structured laboratories on selected samples, still to limit the time waste.

An alternative strategy, that is being developed within a joint EU H2020 project (<http://www.solsa-mining.eu>, sponsored by EU-H2020 Raw Materials, Project SC5-11d-689868) involves at the moment the expert use of following experimental tools: Raman spectroscopy, X-rays fluorescence and X-rays diffraction. The system will be implemented further, by adding hyperspectral imaging, in order to optimise further the measurement protocol.

The base principles on which this cooperative approach is based will be discussed and applied to specific test samples, that effectively show the potential and novelty of the approach.