

# Mineral4/Recognition4

## Optical Image Analysis System

Mineral4/Recognition4 is an advanced optical image analysis system developed by CSIRO and widely used in industry and research for accurate and comprehensive automated identification and characterisation of minerals.

### Image analysis

CSIRO's Mineral4/Recognition4 optical image analysis system enables the automated identification and characterisation of different minerals and porosity within a wide range of different materials. The unique features of the system, such as multi-threshold textural identification, segmentation of different morphologies and non-opaque mineral identification, ensure that this platform is widely used in industry and research.

### Benefits

The CSIRO optical image analysis system enables comprehensive characterisation of a range of lump and fine ores, sinters and coke, providing assistance in:

- predicting downstream processing performance
- improving resource evaluation
- reducing processing costs and improving productivity
- developing waste-management strategies

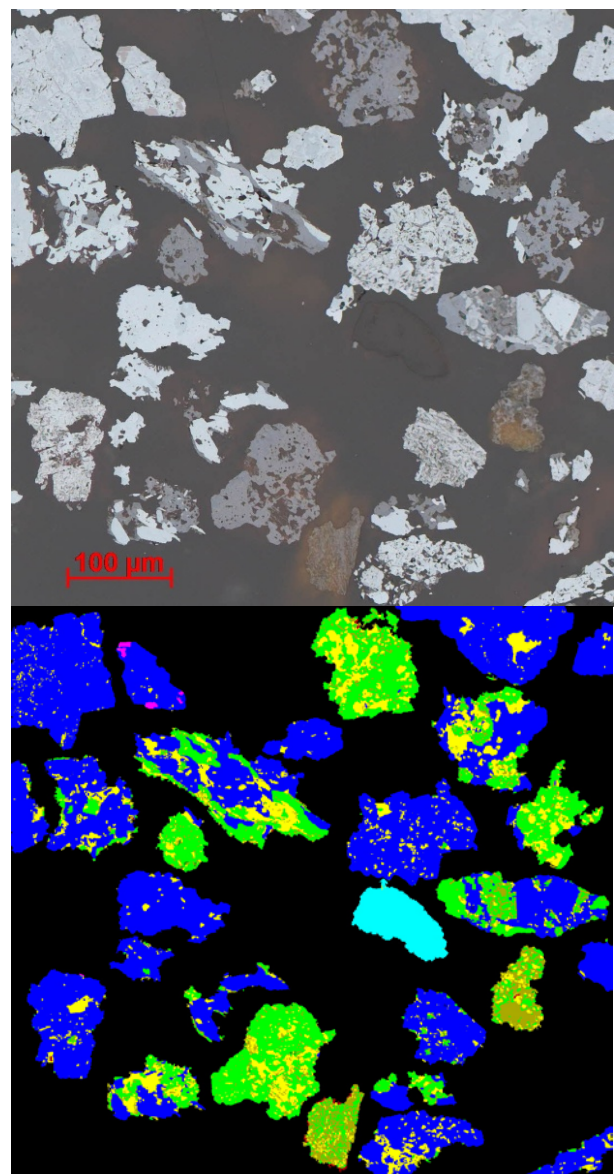
### System capabilities

The optical image analysis system is based on the latest Zeiss technology and includes a microscope with moving stage, a high-resolution camera, a computer, and Zeiss AxioVision software with a CSIRO-customised image analysis module.

### Mineral4

The Mineral4 part of the system allows:

- collection of sets of large images or importing of images from all major formats, for example QEMSCAN/MLA and Raman spectroscopy
- mineral and porosity identification for different lump ores, fine ores and sinters
- creation of mineral maps and particle identification
- particle separation and image correction
- porosity and mineral grain characterisation
- processing of images or sets of images as well as data output to Word and Excel.

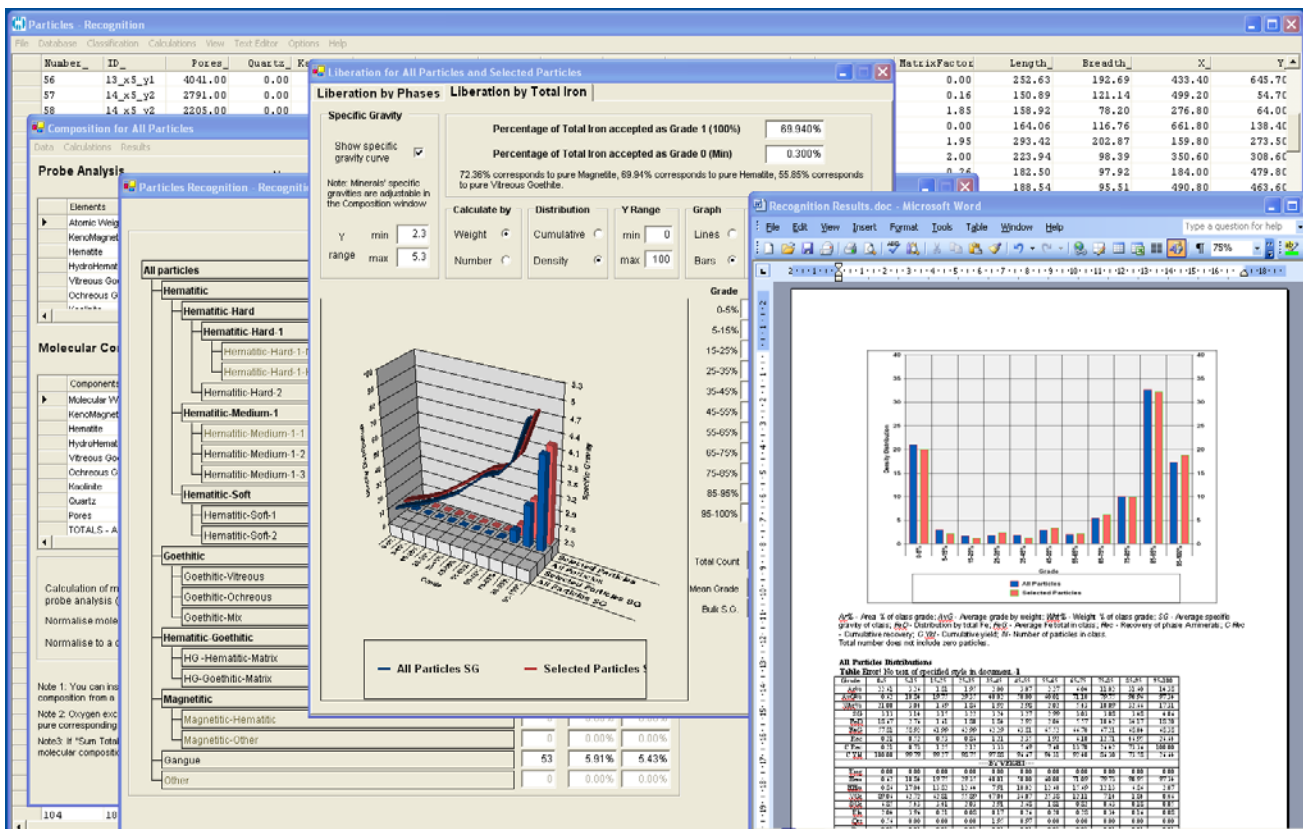


Iron ore minerals identification using Mineral4 (magenta – magnetite, blue – hematite, light green – vitreous goethite, olive – ochreous goethite, maroon – kaolinite, cyan – quartz, yellow – porosity).

## Recognition4

After image processing, the information for every particle section, or image frame for lump samples, can be loaded into CSIRO's Recognition4 software package, which allows:

- development of customised ore textural classification schemes for further automated ore and gangue classification of particles of any size up to ore lumps
- calculation of mineral composition, chemical assay, density, dimensional and textural characteristics for every particle section, as well as identification of liberation class, ore texture class or particle group based on specific mineral, dimensional, textural or chemical criteria
- mineral and specific element liberation classification, and calculation of mineral association characteristics for any group of particles.



Screenshot of Recognition4 software

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FOR FURTHER INFORMATION

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