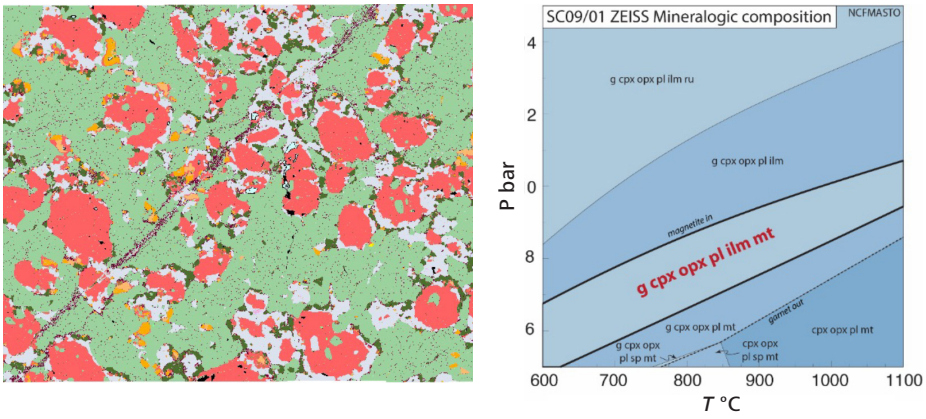
Flexible, quantitative automated mineralogy for geoscience research

ZEISS Mineralogic

ZEISS Mineralogic takes automated mineralogy on the scanning electron microscope (SEM) to the next level. The combination of quantitative geochemical measurements alongside rapid, large area mapping provides a unique geochemistry and petrology solution. Mineralogic goes a step further with flexible outputs of quantitative geochemical data. This allows the user to decide how and where to interrogate their samples, both within the user-friendly Mineralogic interface and with streamlined workflows into third party software.



Quantitative geochemical mapping allows detailed research workflows, such as pressure and temperature (P-T) calculations of metamorphic rocks, to be generated from a single thin section. Here the whole rock composition from a Mineralogic scan is used to generate a P-T pseudosection (phase diagram) and can be refined using mineral modes measured by automated mineralogy.

Three immediate benefits:

1. Large area mapping of quantitative geochemistry and mineralogy
2. New interface visualizes data by mineral class or element heatmap
3. Instant export of element heatmaps directly into third party analytics

Maximum flexibility from the start

The unique capabilities of Mineralogic begin with the flexibility of the SEM platform itself. A wide variety of energy dispersive spectroscopy (EDS) detectors can be used to tailor your instrument to your speed requirements. Users can create their ultimate analytical SEM platform with a wide range of detectors to complement automated mineralogy, including WDS, EBSD and CL.

The power of quantitative geochemistry

The use of quantitative chemistry as the basis for automated mineralogy provides unique capabilities for large area analysis such as thin sections.

Quantitative textural information can be extracted from the sample such as grain sizes, shapes, and mineral associations, alongside quantitative geochemical data providing mineral classification, including mineral and whole rock/sample compositions. This provides a wealth of information for the petrologist to understand their sample and a one-stop shop for many geoscience workflows.

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Seeing beyond

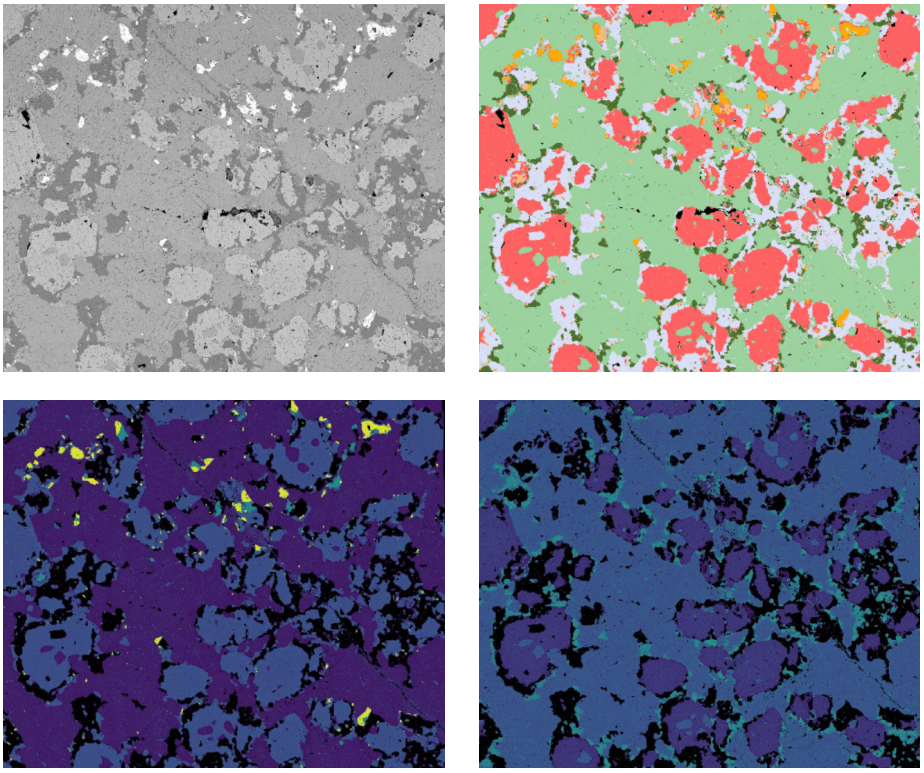
Flexible data visualisation

ZEISS Mineralogic comes with a Large Particle Viewer (LPV) user interface ideal for large area maps such as thin sections. The user friendly LPV allows quick change between automated mineralogy views, e.g., BSE and mineral classification, and quantitative element heatmaps of the entire sample. The simple periodic table interface means elements of interest can be viewed in a fast and intuitive manner LPV features dynamic concentration scales for thresholding elements and highlighting key features. This creates a streamlined way to focus in on important parts of your thin section, such as zoned minerals, and highlight areas for high resolution scans.

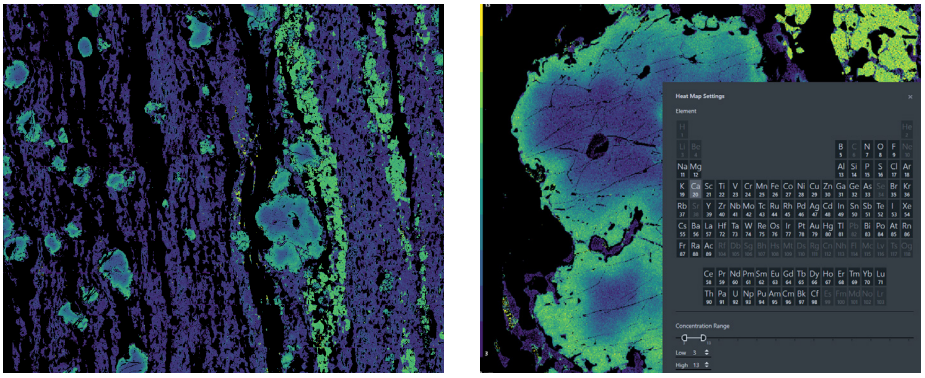
Export images and data with ease

Mineralogic is designed for maximum flexibility on data interrogation. Mineralogic Explorer allows all automated mineralogy outputs, i.e., mineral ID, chemistry, associations and textures to be extracted from within the software.

The Mineralogic LPV allows direct export of any image you are viewing on screen with a single click, whether it's all or part of your dataset, or at a custom concentration threshold. Quantitative elemental heatmap data are exported directly through the periodic table interface in LPV with single or multiple selections. Exported files are designed to expand your data analysis workflows with seamless import into third party software such as XMapTools and FIJI/ImageJ.



Large Particle Viewer (LPV) visualization of a full thin section from the Lewisian Complex, NW Scotland. Single click changes from BSE and mineral classification map, to bespoke ranged element heatmaps all from the same scan. Images show greyscale BSE, Mineral classification, and quantitative Fe and Mg heatmaps.



Full thin section scan of a metamorphic rock from Glenelg, Scotland. Ca heatmap highlights zoned garnets, which are then reanalyzed at higher resolution. Garnet map shows the periodic table user interface for element and concentration range selection.

XMapTools

Collaboration with XMapTools means quantitative EDS from ZEISS Mineralogic can be used to generate structural formulae, end member component calculations, and rapid thermobarometry.

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