

## Large area quantitative EDS mapping for automated mineralogy using ZEISS Mineralogic

Richard J M Taylor<sup>1\*</sup>

<sup>1</sup>. Carl Zeiss Microscopy Ltd, Cambourne, Cambridgeshire, UK.

\* Corresponding author: richard.taylor@zeiss.com

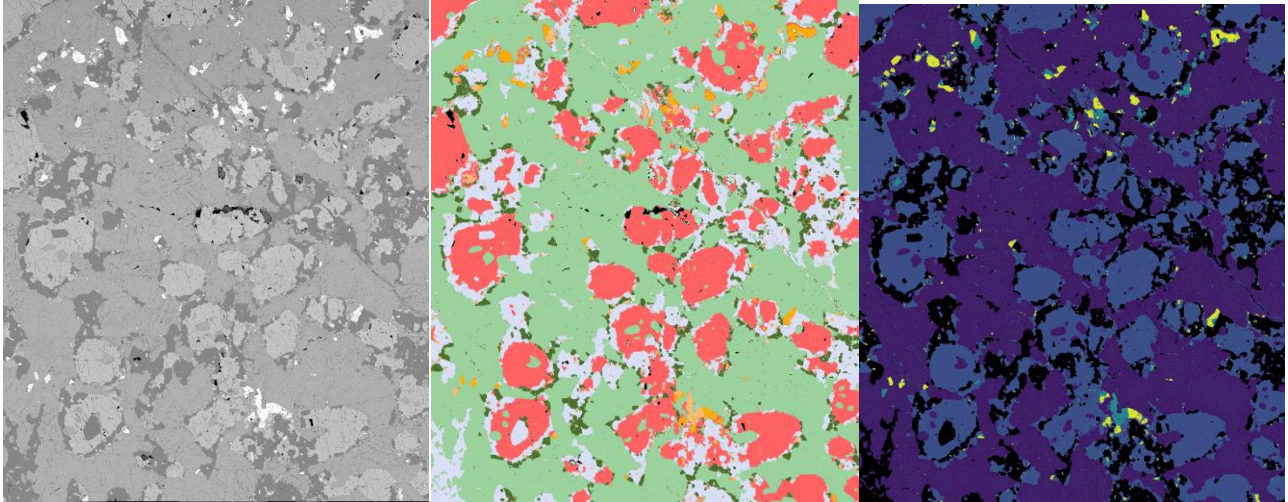
ZEISS Mineralogic takes automated mineralogy on the scanning electron microscope (SEM) to the next level. The combination of quantitative geochemical measurements alongside rapid, large area mapping provides a unique geochemistry and petrology solution. Mineralogic 1.8 goes a step further with new flexible outputs of quantitative geochemical data. This allows the user to decide how and where to interrogate their samples, both within the new, user-friendly Mineralogic interface and with streamlined workflows into third party software.

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

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.

Here we demonstrate the power of large area quantitative EDS mapping by combining ZEISS Mineralogic with geoscience-oriented functions of XMapTools. By importing calibrated, quantitative EDS maps XMapTools can be used to rapidly perform a variety of petrological calculations without the need for a separate, long-winded calibration step using microprobe data. Here we use quantitative EDS from high grade metamorphic rocks to obtain mineral and bulk compositions alongside textural information such as modal abundances. These mapped data are imported directly into XMapTools and can be used to generate oxide values, cation per formula unit (cpfu), end member proportions, and perform thermodynamic calculations.



- **Figure 1.** Thin section scan of a granulite facies metagabbro from the Lewisian Complex, NW Scotland. Multiple outputs can be generated from a single quantitative automated mineralogy dataset including backscatter electron imaging (BSE), false colour mineralogy, and quantitative EDS heatmaps (Fe). Field of view is 2cm horizontally.