Reliable mineralogical characterization Maps Min Software

Thermo Scientific[™] Maps Min Software delivers next-generation automated mineralogy.

Based on Thermo Fisher Scientific's history with QEMSCAN and MLA—two leading automated mineralogy packages— Maps Min Software has been built from the ground up, honoring the legacy of these products while incorporating modern approaches to algorithm and user interface designs. The result is a wholly new approach that provides reliable data without requiring a high level of data quality control and eliminates bias from endless manual intervention.

The core of Maps Min Software is our innovative approach to mineral identification. Our Mixel Technology utilizes an advanced algorithm that makes it possible to identify up to three mineral phases per pixel. Natural materials have complex textures, and the minerals that define those textures have complex and variable compositions. These complexities are built into the Mixel Algorithm, which allows it to accurately identify minerals.

Mineral identification in fine-grained samples, within areas of complex textures, or at phase boundaries is traditionally difficult for SEM-EDS approaches, such as automated mineralogy, to routinely resolve. While legacy techniques require manual intervention to characterize these situations, Maps Min Software produces an automatic answer. In addition to solving these long-standing limitations of the technique, our approach also automates characterization of solid-solution phases by incorporating phase diagrams into the mineral identification algorithm.

Key features

True automated mineralogy. An advanced mineral identification algorithm automatically resolves boundary textures and mixed phases and supports automatic characterization of solid-solution mineral phases, limiting the need for endless editing of mineral lists before or after acquisition.

Easy to learn and train. Simplified acquisition, visualization, and reporting user interfaces paired with more automation deliver more efficient operation and extraction of results.

Less QC, more accuracy. The advanced phase identification algorithm and improved user experience translate to more accurate data with less QC overhead, allowing users of all experience levels to process more data and spend less time manually editing data.



Particle View mode for the Report Browser. Users can review the mineralogy or BSE-based imagery while utilizing filters to prepare data for report finalization and data export.

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Acquisition, validation, and robust chemical characterization

SEM automation is achieved through our Maps Software platform, the flagship imaging automation platform for all Thermo Scientific EM equipment. Robust automation and runs that are easy to set up make this ideal for established or new labs where there is a large variance in user experience. With Maps Software, our flexible template approach makes it easy to build your standard operating procedures. An established routine for acquisition can be directed by an expert and customized for a specific sample or project, and with a few clicks applied to any sample in the microscope.

Once collected and processed with our Mixel Algorithm, data can be quickly viewed in a dedicated QC UI to explore mineralogical results and validate particles and particle separation. With a single click, you can see elemental or mineralogical maps. You can also view dedicated maps that make it easy to spot potentially problematic areas in the sample and accelerate the QC process.

Maps Min Software also incorporates a suite of mineral standards within the larger mineral list. We use these to apply a standards-based quantification of the EDS data. This results in accurate compositional characterization of the sample based on its chemical signature, not a back-calculated assay based on mineral formulas in a lookup table. Assay and mineral compositions are therefore a true reflection of the sample, providing more confidence in comparing data with other modalities and in locating important trace and penalty elements.



Liberation and locking characteristics of carrollite are displayed side by side in the Report Browser UI.

Analysis and reporting

Maps Min Software offers a modern approach to data management and reporting interaction. This approach is built around a centralized data architecture in which reporting data are stored in a single location on your own network. The reporting UI is accessed via an internet browser, so there's no need to install software locally. You can easily access data remotely without the need for copying additional versions of data for further analysis.

Once in the reporting UI, the easy-to-learn, contextual user interface makes exploring results simple and straightforward. There are no hidden tools or options, so data exploration, filtering, and report generation are more efficient. The reporting UI can also be used to manage and customize reporting mineral lists for clarity of results and alignment with established internal norms. Also available is dedicated particle-based filtering to focus data on your goals and clarify final data analysis.

The reporting server is built around a variety of dedicated reports:

- Modal mineralogy
- Elemental assay and deportment
- Grain shape and size statistics
- Particle shape and size statistics
- Mineral liberation
- Mineral locking and associations
- Particle viewing and filtering validation

Reports can be viewed side by side to improve validation and make alignment of observations straightforward.

Once reports are in their final form, extracting results is as easy as a single click. All data in chart images, associated tabular data, and any particle images can be easily exported for further use. In addition, the source database is non-proprietary and accessible by third-party tools. You have the freedom to explore the data utilizing other methodologies or scripts to fully customize your workflows.

Learn more at thermofisher.com/geological-sciences

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