

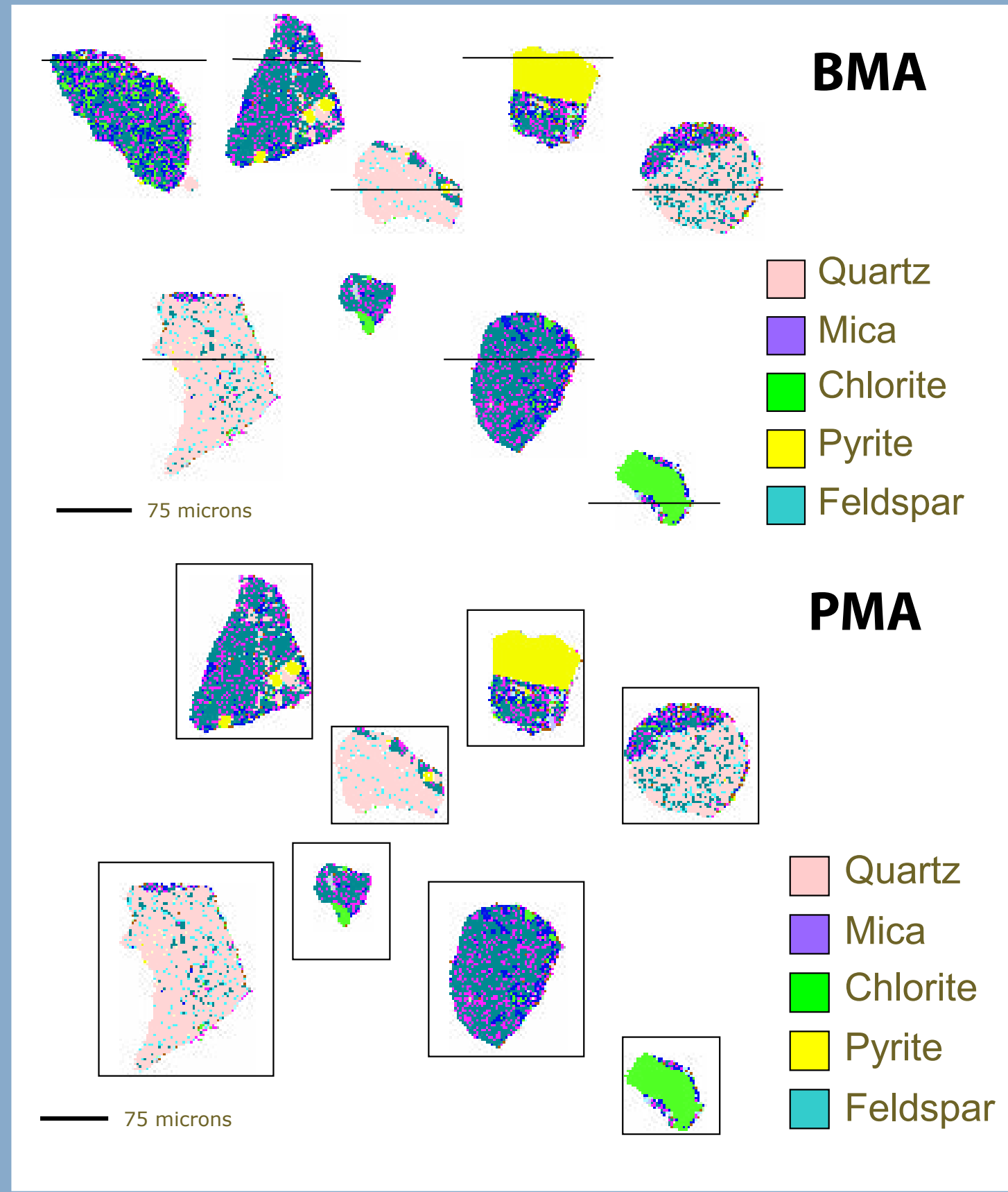
What is QEMSCAN?

QEMSCAN is the state of the art, top of the range automated mineral analyser. It is an analytical tool which provides rapid, reproducible and statistically reliable quantitative information on minerals and certain man-made materials for a variety of disciplines. This tool has been custom developed for the mining industry.

QEMSCAN 650F utilises:

- Field emission gun-scanning electron microscope (FEG-SEM)
- High resolution back scattered electron (BSE) detectors
- State-of-the-art energy dispersive x-ray spectroscopy (EDS) detectors
- Spectral analysis engine

Analysed phases are classified as specific minerals according to their BSE and chemical composition compared to that within a user developed, reference mineral library known as a SIP file (Species Identification Protocol). A detailed database of statistically representative mineralogical information is built up, which is later interrogated by the user.



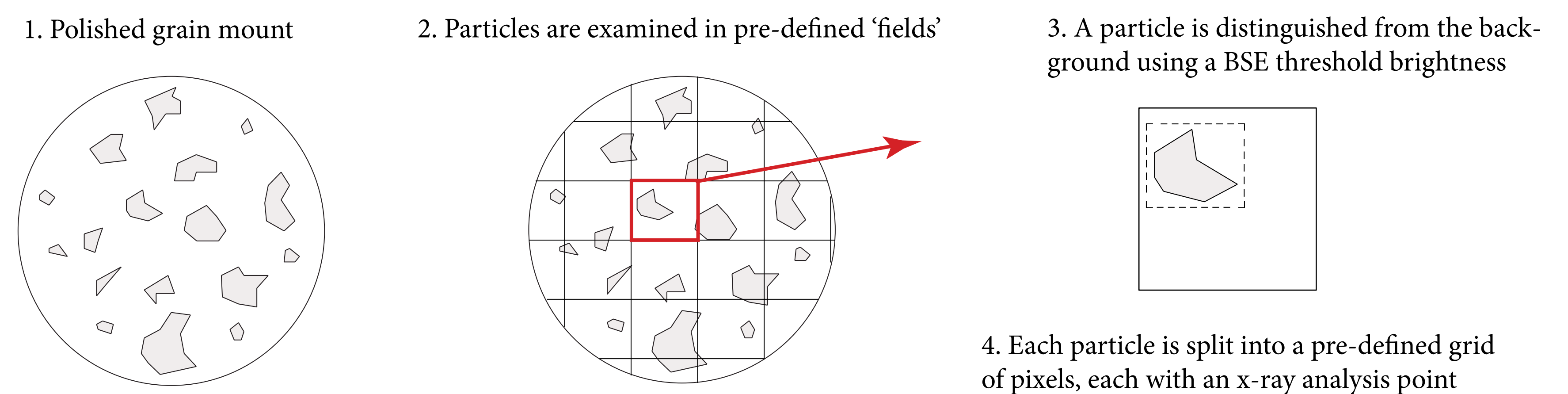
QEMSCAN measurement types

- Bulk Mineralogical Analysis (BMA) – rapid line scan analysis to obtain good statistics on bulk mineralogy
- Particle Mineralogical Analysis (PMA) – detailed particle mineralogical information
- Specific Mineral Search (SMS) – detailed particle mineralogical information on only specific minerals of interest (e.g. sulfides)
- Trace Mineral Search (TMS) – detailed particle mineralogical information on trace mineral phases (e.g. Au, PGMs)
- Field scan – detailed mapping of larger samples (e.g. thin section, drill core)

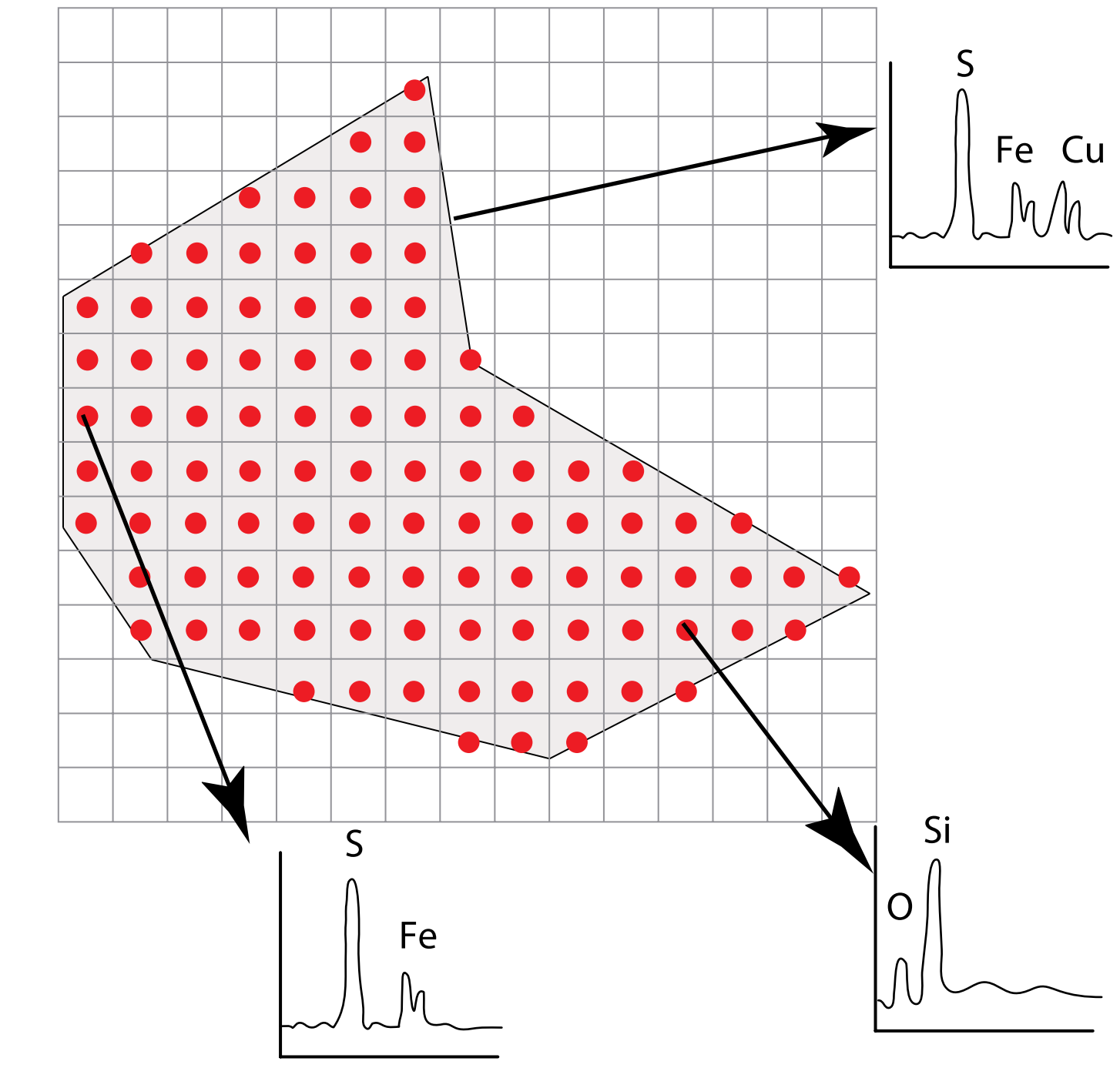
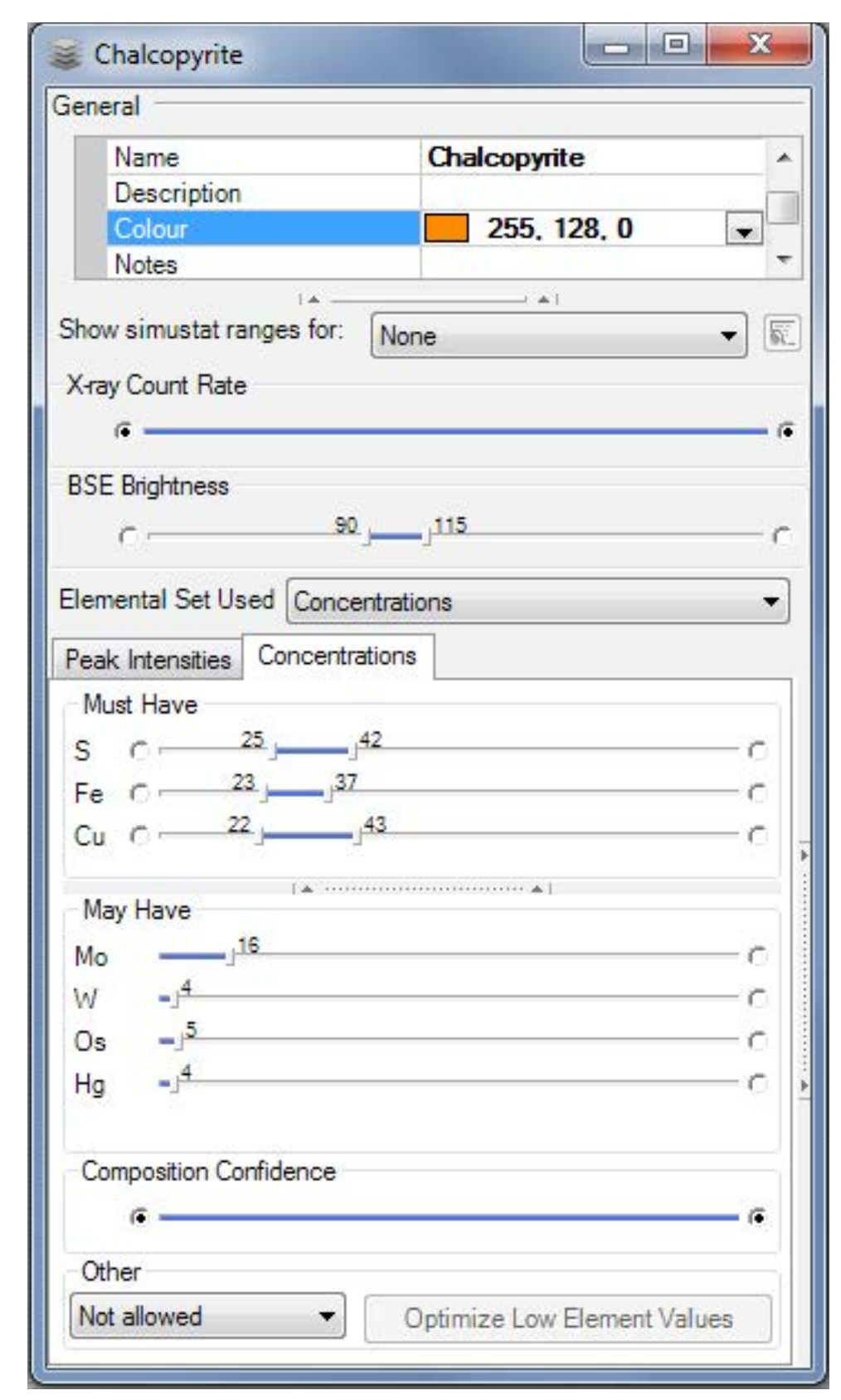
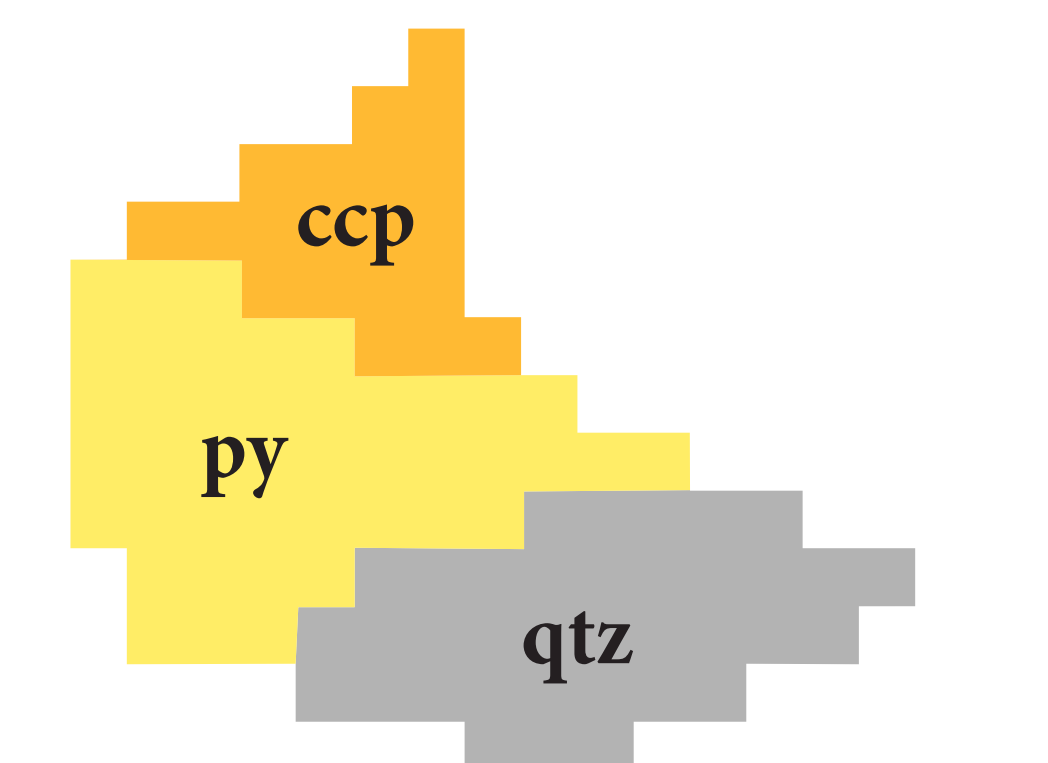
Left: schematic showing the difference between BMA and PMA analysis



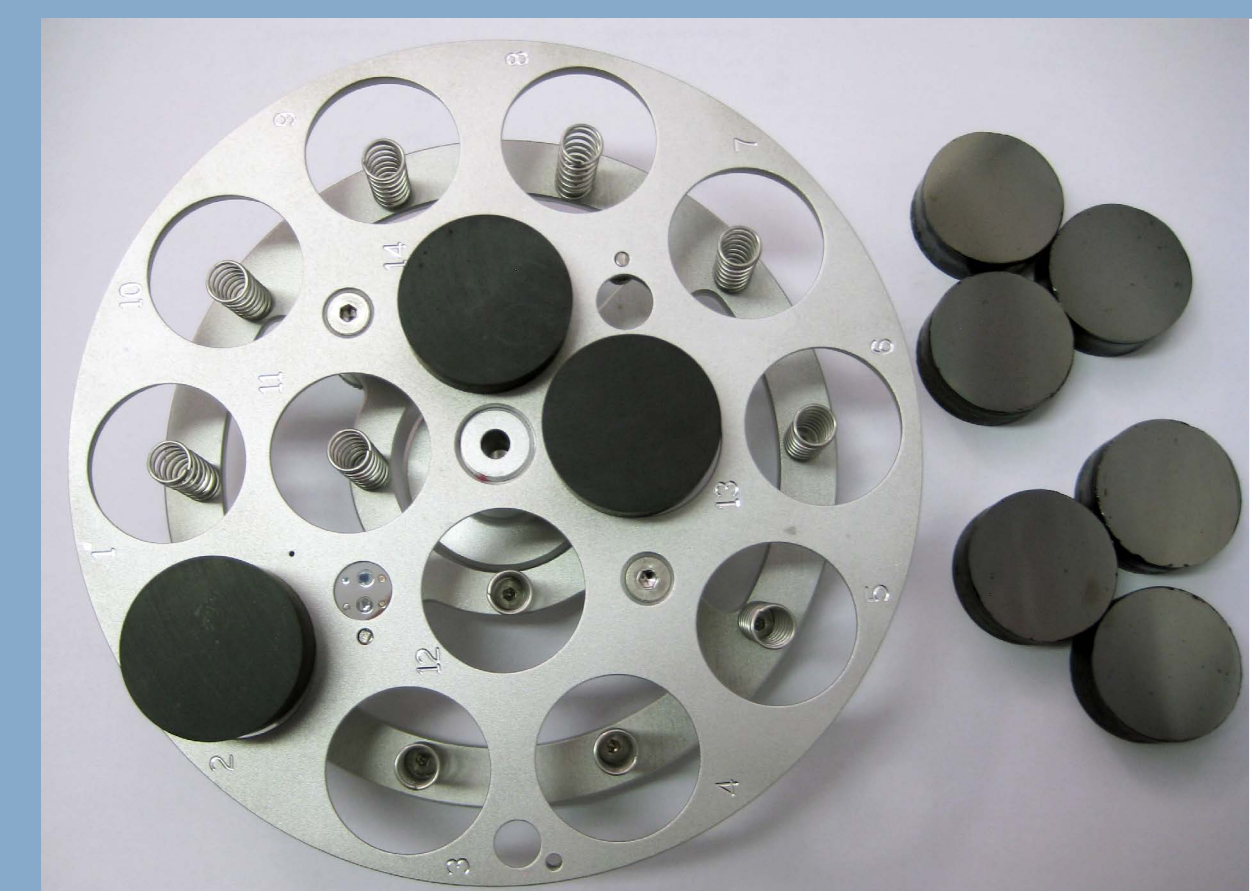
How does the QEMSCAN work?



6. A false colour map is created for each particle; each colour represents a mineralogy or chemical grouping. Quantitative data is also produced.



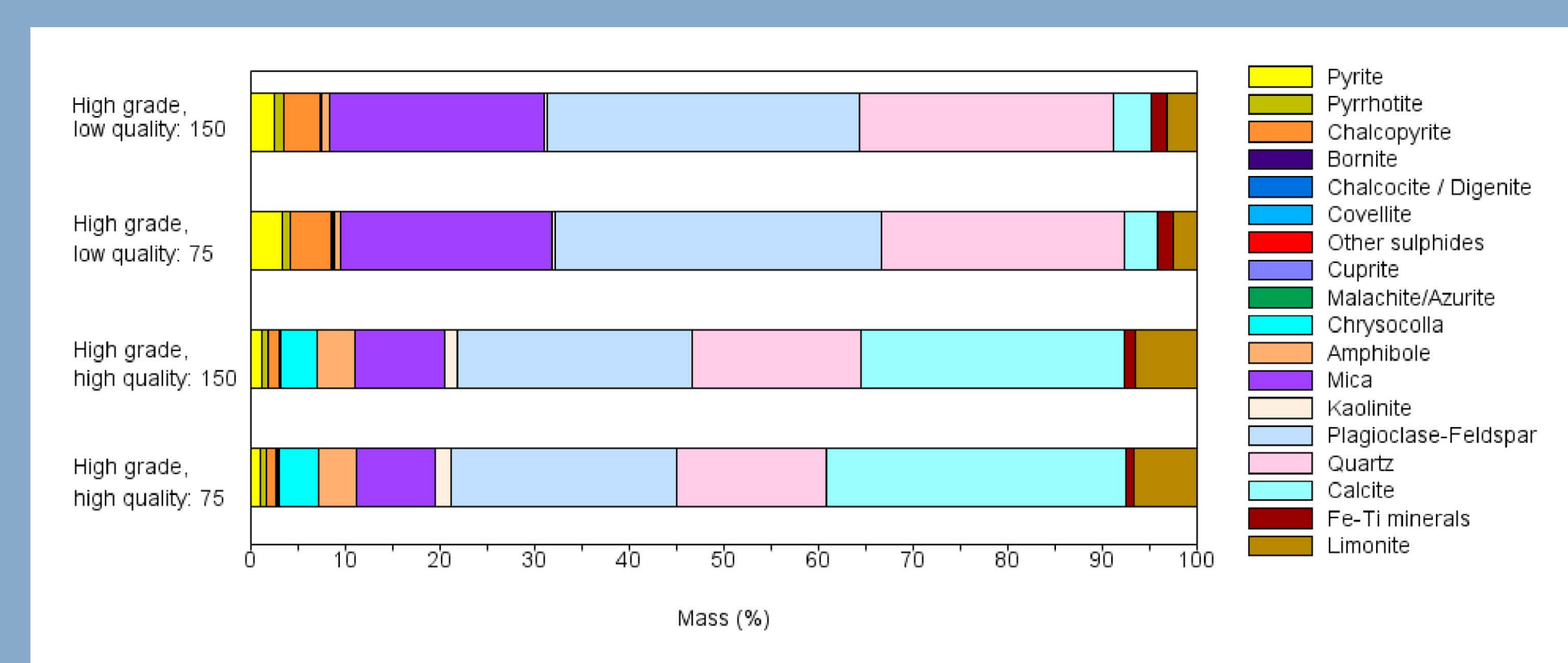
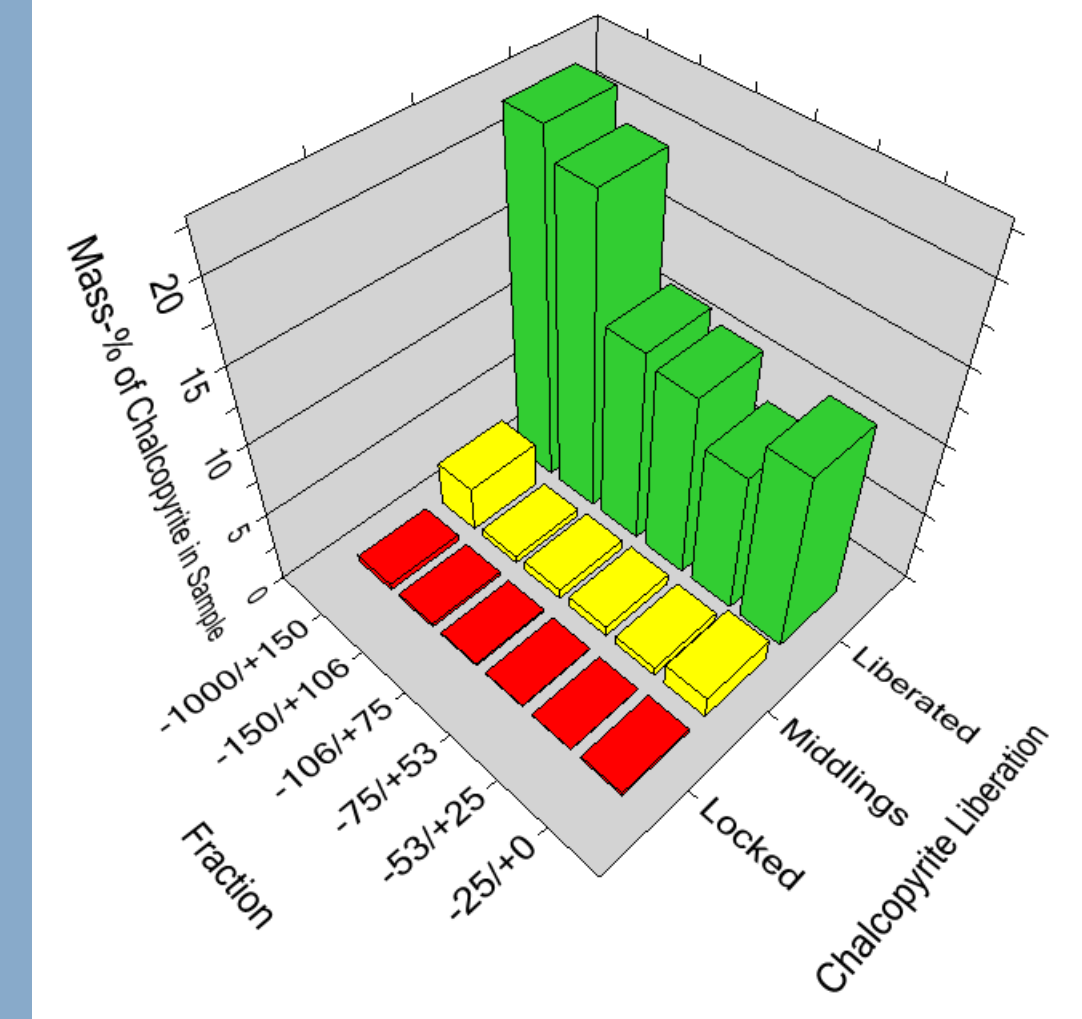
5. Pixels are assigned an identity using the species identification protocol
Left: SIP entry for the mineral chalcopyrite



QEMSCAN 650F (right) and sample block holder with 30mm sample disks (left)

Information obtained from QEMSCAN

- Bulk mineralogy of samples
- Element deportment
- Ore characterisation
- Particle properties (e.g. grain and particle size and shape)
- Particle images
- Mineral liberation
- Mineral association
- Theoretical grade recovery curve



Applications

- Mineral Processing
- Economic Geology
- Geometallurgy
- Hydrometallurgy
- Pyrometallurgy
- Oil and Gas
- Forensics...

