

CODES

Technology Services

~ leaders in ore characterisation

CODES provides a range of high quality technical services related to ore deposit characterisation – offering unique analytical techniques, consistent and reliable results, and delivery times to suit your needs.

Technical services based on LA-ICP-MS

These industry-focussed facilities specialise in rock and mineral chemistry analyses, enhancing mineral exploration geochemistry, and providing solutions to mineral processing problems.

All services are available on a fee for service basis. Contact details are provided on the back cover if you require further information on pricing.

Gold mineralogy

Refractory Au versus inclusions, plus size and chemistry of inclusions.

Comprehensive gold deportment

Determines gold mineralogy and how much of the gold is contained in each mineral.

Elemental concentrations in minerals from rocks, ores, concentrates or tailings

Most elements in the periodic table can be analysed.

U-Pb geochronology

Zircon, monazite, sphene, apatite and uraninite.

Mineral mapping and sulfide ore paragenesis

Mineral zonation and growth history.

Mineral chemical vectoring and fingerprinting by LA-ICP-MS

Pyrite, epidote, chlorite and others.

LA-ICP-MS Facilities

CODES analytical facilities house four laser ablation ICP-MS laboratories specialising in ore deposit applications. The latest enhancement to the capabilities is the Newcrest-funded laser ablation laboratory, equipped with a state of the art, high throughput laser ablation system focused on sulfide applications.

The analytical capabilities are underpinned by an active research program focused on developing novel applications in the field of ore deposit research and other aspects of the earth sciences.





Other Services

XRF Laboratory

This facility houses an Axios Advanced 4.0kW X-ray fluorescence spectrometer by Panalytical. The instrument's automated sampling system enables fast throughput of samples for major and trace element analysis. The lab also has sample preparation facilities for making lithium borate disks for major element analysis, and pressed powder pellets for trace element analysis.

Solution ICP-MS and Clean Room

The facility houses a class 100 clean room for processing samples in an ultra pure environment. It is equipped with a PicoTrace high pressure digestion system, allowing for full dissolution of rock samples with resistant phases. Ultrapure Seastar grade reagents are used to ensure low blank levels and high data quality.

Fluid/Melt Inclusion Laboratory

The fluid inclusion facility uses a Linkam MDS600 motor driven stage with a temperature range -196° C to 600° C.

Lapidary

The facility is equipped with state of the art polishing and thin-section making equipment. It also includes numerous saws for cutting core, thin-sections, laser mounts, and polished sections, allowing for rapid turnaround of sample submissions.

University of Tasmania Central Science Laboratory

In addition, the Centre has reciprocal arrangements with the UTAS Central Science Laboratory, which has an extensive suite of complementary equipment, particularly in the areas of electron microscopy, X-ray microanalysis, laser Raman spectroscopy, ICP-MS, and Mineral Liberation Analysis (MLA).

Visit utas.edu.au/research/central-science-laboratory for further details.

About CODES

CODES is the Australian Research Council Centre of Excellence in Ore Deposits, based alongside the Discipline of Earth Sciences at the University of Tasmania. Formed in 1989, the Centre has grown substantially over the years and is now widely regarded as a global leader in ore deposit research, particularly in relation to the formation of copper, gold, zinc, lead and silver deposits. It is home to 35 highly qualified research scientists and over 100 postgraduate students, further cementing its position as the largest university-based team of ore deposit researchers in the world. The Centre has developed an integrated, ore-systems-based research model that encompasses an array of disciplines, from district architecture, greenfields exploration models, ore genesis and ore characterisation, through to mineral processing and environmental geoscience.

CODES' facilities and expertise are used extensively by other leading research organisations and the minerals industry.

CODES Analytical Services for Metallurgy & Mineral Exploration

Techniques Available

- LA-ICP-MS trace element analyses and / or imaging.
- LA-ICP-MS U-Pb Geochronology.
- Mineral identification and distribution (modal mineralogy by MLA and high resolution SEM).
- Specialist lapidary and petrography services.
- Whole rock geochemistry (XRF, ICP-MS).
- Optical mineralogy.
- Electron microprobe analysis (EMPA).
- Stable isotope mass spectrometry.
- Laser Raman.
- X-ray diffraction.

Examples of Applications

Gold mineralogy (refractory Au versus inclusions)

- Initial appraisal by LA-ICP-MS (6 analyses per sample).
- Comprehensive gold mineralogy (20 LA-ICP-MS analyses & MLA per sample).
- LA-ICP-MS image of element distribution.

Comprehensive gold deportment

The following techniques are available:

- LA-ICP-MS element imaging (gold and trace elemental associations).
- LA-ICP-MS analyses (dissolved gold concentrations).
- Phase identification with automated scanning electron microscopy (MLA).
- Gold particle mineral association.
- Gold particle size histograms and morphology (<0.1 µm diameter).
- Cyanide leaching.
- Modelling to account for large rare particles in small assays.

Elemental concentrations in minerals from rocks, ores, concentrates or tailings

Minerals: oxides, sulfides and silicates, also some metals and sulfur salts.

Elements: to be advised on request.

- Etching to show element zonation.
- Rapid, standard and comprehensive spot or line analysis options available.
- LA-ICP-MS image of element distribution.
- Comprehensive report and data compilation.

NOTES:

- If the minerals to be analysed are present at low abundance, additional mineral separations or MLA may be required.
- Extra charges will apply for arsenopyrite or other high As and Sb minerals.

U-Pb geochronology

Zircon, monazite, sphene, apatite and uraninite

Sample preparation

- Heavy mineral separation and sample preparation.
- Automated mineral search (MLA) for in situ U-Pb geochronology.

U-Pb analysis (including data reduction and reporting)

- Number of analyses depends on the type of samples and the purpose of the analysis.

Two month turn around (standard), but shorter times can be negotiated.

Mineral mapping and sulfide ore paragenesis

The following techniques are available:

- Modal mineral analysis (MLA).
- LA-ICP-MS image of element distribution.
- Laser image phase identification, trace element deportment report.
- S isotope analysis of powdered sample (sulfide or sulfate minerals).
- Pb isotope analysis (Laser or Solution ICP-MS).

Mineral chemical vectoring and fingerprinting by LA-ICP-MS

- Pyrite
- Magnetite
- Hematite
- Titanite
- Epidote
- Chlorite (for sponsors of AMIRA projects P765A or P1060).

For more information contact

General information and pricing

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Please visit our website:

utas.edu.au/codes for further information.



Contacts

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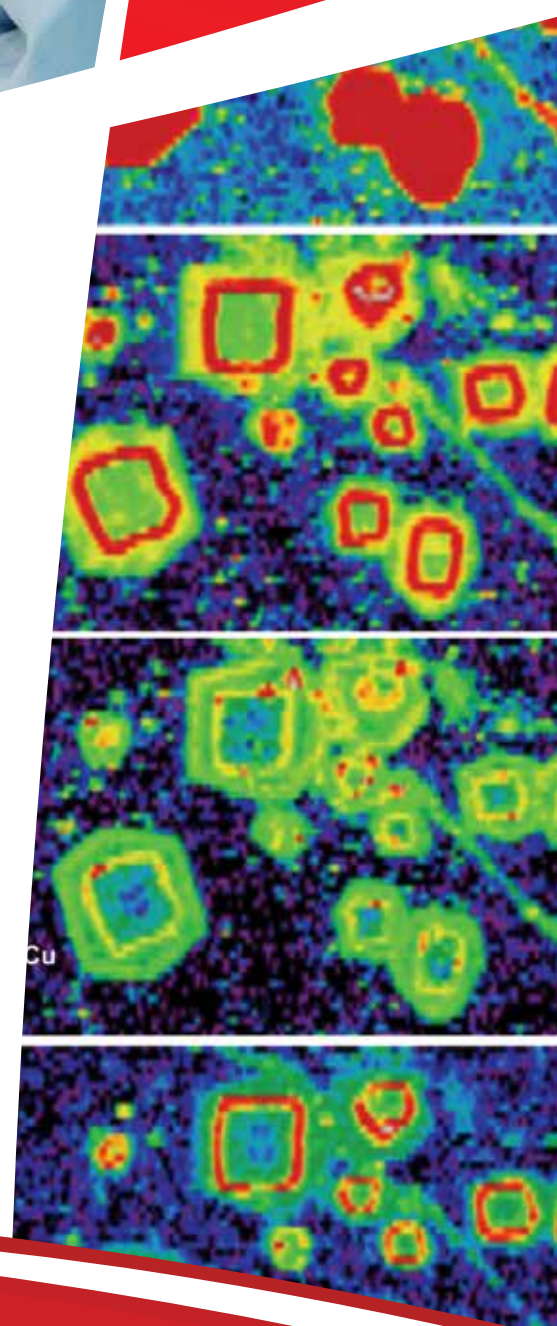
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Please visit our website:

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