



THE UNIVERSITY OF
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N A N O

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WAVELENGTH DISPERSIVE X-RAY MICROANALYSIS: PRACTICAL WORKSHOP

THE NEXT WORKSHOP WILL BE: As required (full day). Register your interest online now!

WHO SHOULD ATTEND THIS WORKSHOP?

This workshop will involve an introduction to the theory of Wavelength Dispersive X-ray Microanalysis (WDS), as well as practical instruction in how to set up an analysis file for the CMCA WDS microprobe, and how to use that file to analyse appropriate samples. *This course is only available to people who can demonstrate a need for practical training in WDS microanalysis, and who will need to collect WDS analyses in the near future.* Expected participants are those who:

- need quantitative microanalysis of phases with overlapping x-ray peaks (e.g. Rare Earth Elements, sulphides) that cannot be resolved by EDS analysis
- need trace element (10s-100s ppm) analyses of phases
- need high-precision chemical analyses for specific purposes, e.g. thermobarometry of mineral phases
- need to acquire WDS x-ray element maps

WORKSHOP OUTLINE:

The workshop will run over an entire day from 8:30 am – 5 pm, and will include short lectures, practical training and exercises, and discussions related to the best techniques for analysing participants' samples. There will be opportunities for participants to seek advice or discuss problems related to their own samples with experienced microanalysts. The course will involve hands-on training in the following areas:

- Setting up an analysis file using Virtual WDS software
- Calculation of detection limits and counting times
- Pulse Height Analysis
- Calculation of overlap factors
- Testing the analysis file with secondary standards
- Analysis of 'unknowns'

WHAT SHOULD YOU KNOW BEFORE THE WORKSHOP?

Participants must justify why WDS analysis will be needed for their project. They must have completed the basic training courses in SEM and EMPA, and be familiar with course materials available on CD prior to the workshop.

WHAT IS NOT INCLUDED IN THIS WORKSHOP?

Training in SEM operation and EDS electron microprobe analysis is not included, but is a prerequisite for the course. Techniques of sample preparation for WDS analysis are not included in the course.

RELATED TRAINING OPPORTUNITIES:

This workshop is only suitable for people requiring WDS x-ray analyses from their samples.

Those people:

- Wanting *information* about x-ray microanalysis should consult the list of information resources provided below.
- Needing to learn how to use an SEM should complete the CMCA Training course on SEM
- Needing to learn about basic x-ray microanalysis by energy dispersive spectroscopy (EDS) should complete the CMCA Training course on EMPA

ADDITIONAL RESOURCES & INFORMATION:

Some information on the theory and practice of WDS electron microprobe analysis will be provided to participants on CD prior to the workshop. To maximise the benefits from the workshop, all participants are expected to be familiar with this additional material before attending the workshop. They should also consult items from the list of recommended references below. For additional information, people should also search the UWA library catalogue for other titles of interest.

- Goldstein, J., Newbury, D., Joy, D., Lyman, C., Echlin, P., Lifshin, E., Sawyer, L. and Michael, J., 2003. *Scanning Electron Microscopy and X-Ray Microanalysis 3rd Edition*. Kluwer Academic/Plenum Publishers.
- Reed, S.J.B., 2005. *Electron Microprobe Analysis and Scanning Electron Microscopy in Geology 2nd Edition*. Cambridge University Press.
- Reed, S.J.B., 1993. *Electron Microprobe Analysis 2nd Edition*. Cambridge University Press.
- Scott, V.D., Love, G. and Reed, S.J.B., 1995. *Quantitative Electron-Probe Microanalysis 2nd Edition*. Ellis Horwood Limited.
- Reed, S.J.B., 2000. Quantitative trace analysis by wavelength-dispersive EMPA. *Mikrochim. Acta*, **132**, 145-151 (and other papers in the same issue).
- Reed, S.J.B., 2002. Optimization of wavelength dispersive x-ray spectrometry analysis conditions. *J. Res. NIST*, **107**, 497-502 (and other papers in the same issue).

WHEN AND WHERE IS THE WORKSHOP HELD?

The workshop is held at the [Centre for Microscopy, Characterisation and Analysis](#) at The UWA. The workshop will run as demand requires, which is likely to be several times per year.

HOW DO I REGISTER & WHAT DOES IT COST?

Places on this workshop are available to students and researchers with a demonstrated need for practical training in WDS x-ray microanalysis. You can apply to attend the next workshop by completing the online registration form.

Places are limited and preference will be given to registered CMCA Clients. Your place will be confirmed in advance of the next scheduled workshop.

To find out about becoming a CMCA Client contact the CMCA Manager, Jeanette Hatch (e-mail: admin@cmm.uwa.edu.au or phone: 6488 2770).

The workshop is free to current registered CMCA Clients. All other interested participants will be allocated a place only if maximum numbers are not reached, and a cost of \$220 (inc. GST) will apply. Any enrollee who fails to cancel their attendance more than 24h in advance will be charged a \$55 (inc. GST) no show fee.