

**Core Facility Electron Beam Microanalysis (CFE)
Laboratory for Electron Probe MicroAnalysis (EPMA)****University of Vienna, Faculty of Earth Sciences, Geography and Astronomy****Laboratory and usage regulations****1. Organizational units/subunits involved**

At the University of Vienna, Faculty of Earth Sciences, Geography and Astronomy (FGGA), a laboratory for Electron Probe Microanalysis (EPMA) is operated as part of the Core Facility Electron Beam Microanalysis (CFE). The participating institutes/departments (subunits) are:

- Department of Lithospheric Research (DfL)
- Institute of Geology (IfG)
- Institute of Mineralogy and Crystallography (IfMK)
- Institute of Paleontology (IfP)

2. Laboratory

This laboratory is equipped with an Electron Probe MicroAnalyzer (EPMA), which is used for high-precision spatially resolved qualitative and quantitative elemental analysis using wavelength-dispersive X-ray spectroscopy (WDX) and qualitative and semi-quantitative elemental analysis using energy-dispersive X-ray spectroscopy (EDX).

The EPMA laboratory serves the researchers of the Earth Science subunits of the FGGA. In addition, members of other faculties and centres of the University of Vienna and external partners have access to the EPMA laboratory in the framework of research collaborations and contract research.

Infrastructure

The CAMECA SX Five electron probe microanalyzer is equipped with a Schottky thermal field emission cathode and five crystal spectrometers for high-resolution elemental analysis on polished solid surfaces. The device is also equipped with a system for energy-dispersive X-ray spectroscopy (EDX) for rapid semi-quantitative elemental analysis.

Responsible for the organization of the laboratory operation, as well as for the maintenance of the device are:

Univ.-Prof. Mag. Dr. R. ABART
Tel: ++43-1-4277-53319

(Head of the Laboratory)
Email: rainer.abart@univie.ac.at

Dr. Elena Petrishcheva
Tel: ++43-1-4277-53445

(Laboratory Management)
Email: elena.petrishcheva@univie.ac.at

Hr. Franz Kiraly
Tel: ++43-1-4277-53140

(Laboratory Technician, Operator)
Email: franz.kiraly@univie.ac.at

3. Financing, consumables contributions

To cover the operating and maintenance costs for the electron probe microanalyzer and for the peripheral equipment, the users of the EPMA laboratory pay consumables contributions. The "UNIVIE INTERN" rate applies for the use of equipment by members of the University of Vienna, the "UNIVIE EXTERN research cooperation" rate (= UNIVIE INTERN + 25%) applies for external

research collaborations, and the “UNIVIE EXTERN contract research” rate (= UNIVIE INTERN + 60%) applies to contract research. The UNIVIE INTERN rate is based on empirical values, assuming 150 days of equipment use for research and 50 days for service per year. Rates may be adjusted annually. The booking of and charge for instrument usage is done per slot; there are three slots per day: **slot 1** = 9:00 – 13:00; **slot 2** = 13:00 – 17:00; **slot 3** = 17:00 – 9:00 (following day)

Rate per slot ¹	UNIVIE INTERN	UNIVIE EXTERN research cooperation	UNIVIE EXTERN contract research
all EPMA applications	100 €	125 €	160 €

¹ **slot 1** = 9:00 – 13:00; **slot 2** = 13:00 – 17:00; **slot 3** = 17:00 – 9:00 (following day)

4. Structure: functions - competencies – responsibilities

Roles within the EPMA laboratory		
role	competences	tasks / responsibilities
head of laboratory	provision of laboratory equipment	Investment planning, application at infrastructure calls
	responsibility for the laboratory	implementation and monitoring of the laboratory regulations, representation of lab before CFE-, faculty- and university management, supervision of laboratory operation, monitoring of laboratory operation
	accounting	supervision of book keeping, §27 project processing
lab manager	scheduling coordination	ensuring efficient laboratory operation
	documentation of usage	collection of information regarding device usage, data output
	support of users	post-processing of analytical data
lab technician	technical device support	maintaining the operational readiness of the device, device maintenance, troubleshooting, carrying out repairs, coordination of service visits
	methods development	service to users for the implementation of special methods of data collection ²
operator	data collection	support for the user during the preparation, execution and follow-up of data collection ²

²Scientific staff who have contributed to data collection or data analysis and thus made a significant scientific contribution must be named as co-authors in all publications in which these data are used.

Roles outside the EPMA laboratory		
role	competences	tasks / responsibilities
CFE contact person	first point of contact for users of the respective subunit	supporting the user from the respective subunit in the planning of analytical projects
		allocation of the pre-financed device usage of the respective subunit in coordination with the leadership of the respective subunit
	contact person for CFE personnel and for the leadership of the respective subunit	communication between CFE staff and members of the respective subunit
		coordination of the settlement of consumables contributions invoices
user	Definition of the analytical tasks	Planning the analytical tasks in coordination with CFE contact person / laboratory manager
		filling out the application form for EPMA use
	Sample preparation	provision of suitable sample material

5. Personnel

role	person
Head of the laboratory	ABART Rainer
laboratory management	PETRISHCHEVA Elena
Lab technician	KIRALY Franz
operator	KIRALY Franz
CFE contact person DfL	N.N.
CFE contact person IfG	N.N.
CFE contact person IfMK	N.N.
CFE contact person IfP	N.N.

6. Regulations for usage

6.1 Development of plans for utilization of EPMA equipment

For users belonging to one of the subunits involved in the Core Facility Electron Beam Microanalysis (CFE) (see point 1), the CFE contact person of the respective subunit is the first point of contact for development of plans for EPMA use. The respective CFE contact person, in consultation with the respective subunit management, decides how to allocate pre-financed device usage of the respective subunit and notifies the laboratory manager of planned equipment usage. For users belonging to another organizational unit of the University of Vienna (not listed under point 1), or for external users, the initial contact person is the laboratory manager.

6.2 Making an appointment

A measurement day is divided into three slots: 9:00-13:00, 13:00-17:00, and 17:00-9:00 of the following day. The smallest bookable time unit is one slot, a working day contains 3 slots (24 hours).

To make an appointment to use the equipment (after consultation with the CFE contact person for your subunit, if relevant), please contact:

Dr. Elena Petrishcheva Tel. 4277-53445, email: elena.petrishcheva@univie.ac.at.

The appointment is binding. If the user is unable to attend, this must be announced at least three working days before the planned date for using the equipment. Repeated unjustified non-attendance of an agreed appointment or unjustified postponements at short notice may lead to exclusion from laboratory use by the laboratory management. An agreed appointment can be cancelled or postponed by the laboratory manager if unforeseen disruptions in laboratory operations occur. Users are not entitled to reimbursement of any costs related to postponement or cancellation of appointments incurred in connection with the planned analytical undertaking.

6.3 Sample preparation

Sample dimensions

The following specimen formats can be accommodated by the standard specimen holders:

- (1) polished thin section with dimensions 48 x 28 x 1 mm
- (2) Polished round specimen, in synthetic resin or on glass slide, \varnothing 25 mm

Other sample formats may be possible after individual consultation.

Specimen quality

A high-quality polish and minimal relief are essential prerequisites for quantitative analysis. Polished sections should not be thinner than 30 μ m to avoid fluorescence radiation from the glass slide.

The samples must be coated with an electrically conductive surface layer for EPMA analysis. A 15-20 nm thick carbon layer is vapor-deposited as standard. For the quality of the carbon coating, it is important that the samples are carbon coated in an absolutely clean, grease-free, dust-free and dry condition. After carbon coating, the samples may only be handled with laboratory gloves and must be kept dry in dust-free containers. Any contamination by fingerprints must be avoided.

Positioning on the sample

For positioning on the specimen, it is advisable to take a picture of the entire specimen (scan or macro photo - preferably before final cleaning and carbon coating). For orientation within small areas, it is recommended to take reflected and transmitted light images of the areas of interest. Reflected light images are most similar to electron-optical images and are therefore best suited as an orientation aid. Ideally, both transmitted and reflected light images should be taken.

Preparation for the measurement campaign

Preliminary information to laboratory management/operator

The laboratory management or operator must be contacted at least five working days before the planned measurement date. At this point at the latest, it must be clarified who will supervise the planned measurement campaign.

The following information must be provided at this time at the latest:

- (1) Type, number and dimensions of the samples to be processed
- (2) Analytical tasks: e.g. point analyses, images, ...
- (3) Elements to be analysed

6.4 Analysis results, data transfer, publication

The Operator transmits the data in electronic form to the User as soon as possible after data collection. The data generated in the CFE on behalf of or for a user are handed over to the respective user for use in his/her own scientific research or, in the case of contract research, for further unrestricted use. CFE officials are permitted to use any data generated in the CFE for teaching purposes, for internal university reports, and for public relations or advertising purposes relating to the CFE, provided that the operator who has generated the data is named. Use of the data for scientific purposes is only permitted with the consent of the user to whom the data was transferred.

We aim to make data generally accessible and usable in accordance with the FAIR Data principle after an embargo period to be defined individually for each project. For output from scientific projects, the embargo period should be a maximum of five years. For results from contract research, the embargo period is unlimited.

In any publications in which data generated in the CFE are used, the CFE and the respective laboratory must be named, and this naming must be reported to the responsible laboratory manager. In addition, scientific staff working at the CFE who have contributed to data acquisition or data analysis and thus made a significant scientific contribution must be named as co-authors of publications in which data from the EPMA laboratory are used.

The laboratory must be named in publications using the following designation:

DE: „EMS Labor der Core Facility Elektronenstrahlmikroanalytik, Fakultät für Geowissenschaften, Geographie und Astronomie der Universität Wien (AT)“

EN: “EPMA laboratory of the Core Facility Electron Beam Microanalysis, Faculty of Earth Sciences, Geography and Astronomy at the University of Vienna (AT)”

6.5 Recording the use of equipment in the laboratory logbook

The operator must record the use of the equipment truthfully and correctly in the laboratory logbook.

6.6 Reference to the General Laboratory and Workshop Regulations of the University of Vienna

Furthermore, the guidelines of the General Laboratory and Workshop Regulations of the University of Vienna (Gazette 2020/2021 - 24th edition, No 91, issued on 24.02.2021) apply:

https://mtbl.univie.ac.at/storage/media/mtbl02/02_pdf/20210224-24.pdf

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1. Application form for access to the EPMA laboratory

(please send the completed and signed form via email to elena.petrishcheva@univie.ac.at)

Name of **Applicant**: _____

Affiliation: _____

Name of the **collaborator/supervisor affiliated with** the Faculty of Earth Sciences, Geography and Astronomy (University of Vienna): _____

- 1) Analytical project description and aims (max. ½ A4 page)
- 2) Analytical method(s) to be applied
- 3) Required expenditure of machine time
 - estimated machine time
 - number of samples
- 4) Financial commitment
The consumables fee for EPMA usage [100 Euro / slot; + 25% overheads for research collaborators external to the University of Vienna, + 60% overheads for contract research] will be covered by project:

- 5) Embargo period for raw data after data transfer to User _____

- Herewith, I confirm that I have read the Laboratory Regulations of the Electron Microprobe laboratory, and I agree to adhere to the regulations specified therein.
- Herewith, I confirm that the scientist(s) who contributed to the collection and/or processing of data acquired in the analytical project specified above, will be involved as co-author(s) in publications which include these data.

Signature, date _____
(user of the EPMA laboratory)