EMS MICROSCOPY ACADEMY
X-RAY MICROANALYSIS WORKSHOP: A COMPLETE PICTURE

This course covers qualitative and semi quantitative analysis, beginning with the generation of background and characteristic of x-rays, nomenclature, and peak family ratios.

Examples of the endless possibilities in the field of Microscopy

Details

Tuesday - Thursday
January 21 - 23, 2020
8:30 a.m. - 4:30 p.m.
Hatfield, Pennsylvania, USA

Targeted Participants

Individuals who are, or soon will be, expected to operate an SEM, choose appropriate parameters for EDS, and perform qualitative and semi quantitative analysis on materials samples.

The EMS Microscopy Academy

Located in Hatfield, Pennsylvania, the Academy provides electron microscopy classes, workshops and training sessions for all fields of microscopy, including materials science and biological science.
Scope of Class

The nondestructive elemental identification of a sample’s micro-composition is a powerful tool for the microscopist. This technique can detect elements from boron to uranium with a minimum concentration detectability of 1000 ppm in solid samples.

This course covers qualitative and semi quantitative analysis beginning with the generation of background and characteristic of x-rays, nomenclature, and peak family ratios.

Collection parameter settings of both the EDS system and microscope, their effect on the spectrum and quality of the subsequent quantification are of primary importance. The non-variable parameters of working distance and tilt will be demonstrated as well as the effect of accelerating voltage on background shape, x-ray spatial resolution, over-voltage requirements, and accuracy of ZAF matrix corrections examined. With the advent of the silicon drift detector (SDD) the pulse processor time constant and beam current (spot size) settings to control % dead time are almost a moot point but will be introduced for those who work with a SiLi detector.

Identification of individual elemental lines as well as methods used for determining peak overlaps such as peak shape, peak family ratio anomalies, and the presence of a peak unassociated with known elements will be paid particular attention.
Quantitative analysis will be limited to the use of ZAF and PhiRhoZ routines but the collection of standards and their use in a full quant will be discussed. Backscattered (BSE) imaging will be correlated with x-ray maps and spectral imaging results.
Energy calibrations will also be performed.
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Format

Lecture, demonstration, and hands-on practice, as well as round table tips and tricks discussions. Participants are encouraged to bring their own samples, if possible.

Main Curriculum

Generation and nomenclature of x-ray lines
Spectral artifacts
Deconvolution of peak overlaps
Qualitative analysis
Semi quantitative analysis
Hardware settings/function
Setup and operation of SEM for BSE imaging and spectral acquisitions
Sample requirements for BSE/EDS

Equipment

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<th>Hitachi SU 3500 SEM</th>
<th>Bruker Esprit SSD</th>
<th>MAC Element Standards</th>
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Faculty

Michael Kostrna was the program director of the Electron Microscopy Technician program at Madison Area Technical College and has more than 35 years in EM technical education and research experience. He has been training EM students for 29 years and has developed curricula and lab exercises for TEM, SEM, OLM, lab safety, introductory and advanced biological EM, EM, maintenance, and x-Ray microanalysis. He has worked with companies such as SC Johnson Polymer, Dow Chemicals, Io Genetics, Virent Technologies, ABS Global, NanoOnocology, and Microscopy Innovations, and in the process gained insight to the various applications of EM.

Al Coritz has been doing Electron Microscopy for 38 years, beginning at the Yale School of Medicine and ending up on the commercial side with several key EM companies. His specialty is Cryo-techniques and Thin Film Technology: i.e. Freeze Fracture/Rotary Shadowing, High Pressure Freezing, and more He is currently with Electron Microscopy Sciences where he has been the Technical Director for over 20 years.
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Schedule

Tuesday, January 21, 2020

8:30-9:00  Introduction of staff and participants
9:00-10:30  X-ray generation, nomenclature, and peak identification
10:30-11:00  Break
11:00-12:00  FWHM, peak overlaps, and qualitative analysis
12:00-12:30  Hosted lunch
12:30-3:00  Demonstration of SEM operation and EDS acquisition
3:00-4:30  EDS software setup and qualitative analysis
6:00  Dinner

Wednesday, January 22, 2020

8:30-9:00  Round table discussion of previous day’s activities
9:00-10:00  SEM parameters affecting spectral acquisition
10:00-10:30  Break
10:30-12:00  Demonstration of overvoltage and other collection requirements
12:00-12:30  Hosted lunch
12:30-3:00  Group A hands-on EDS operation, acquisition, and spectral analysis
            Group B sample preparation for accurate quantification
3:00-4:30  Group A sample preparation for accurate quantification
            Group B hands-on EDS operation, acquisition, and spectral analysis

Thursday, January 23, 2020

8:30-9:00  Round table discussion of previous day’s activities
9:00-10:00  Semi quantitative analysis, ZAF and Phi Rho Z
10:00-10:30  Coffee Break
10:30-12:00  Demonstration and hands-on semi quantitative analysis
12:00-12:30  Provided lunch
12:30-4:30  BSE / spectral map / line scan acquisition

Schedule subject to change
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Registration Fee: $995.00 Includes

- Workshop syllabus
- All supplies
- Reagents and solutions
- Lunches
- Coffee
- Tea
- Dinner on the first evening of the workshop

Lodging

Participants are responsible for making their own hotel reservations.

The following hotel has been designated as the host hotel:

**Homewood Suites**
1200 Pennbrook Parkway
Lansdale, PA 19446
Phone: 215-362-6400

The special rate is $119.00 per night (plus tax) which includes a hot breakfast and a light dinner in the evening.

Please make your reservations and mention you are participating in the EMS Workshop.
GROUP CODE: EMS WORKSHOP

Everyone should plan to arrive the night before class begins.

Enrollment Note

Registration will be limited to a maximum of 15 participants.
EMS will provide samples to those who prefer not to bring their own.
Printable Registration Form

________________________________________________________________________ M / F
Name / Title

________________________________________________________________________
Institution

________________________________________________________________________
Department

________________________________________________________________________
Mailing address

________________________________________________________________________
City / Zip

________________________________________________________________________
Country

________________________________________________________________________
Telephone / Fax

________________________________________________________________________
Email:

________________________________________________________________________
Will you bring your own specimens? Yes__ / No__ (See Note on prior page)
What Samples are you bringing and most interested in?

________________________________________________________________________

All registrations must include payment.
Rate $995.00 per Person
Number of Participants ________
Total $________

Pay by check: make payable to EMS and reference “X-Ray Microanalysis Jan20”.
Pay by credit card: Credit Card Type ______________________________
Credit Card Number ______________________________
Expiration Date ________________ 3 Digit Code ________________

Signature / Date

Return your registration to:
Stacie Kirsch
1560 Industry Road
Hatfield, PA 19440 USA
Phone: 215-412-8402
E-Mail: info@emsdiasum.com or Fax: 215-412-8452

TO REGISTER ONLINE, CLICK HERE.