

CH SOP-25- Elemental analysis using the Amray 1810 PGT detector

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Approved by Director: Dr. Guy Vallaro

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PURPOSE:

The analysis of miscellaneous samples by scanning electron microscopy with energy dispersive X-ray detection is a method employed by the Chemistry Section of the Laboratory. The following procedure shall serve as a guideline for documenting, analyzing and interpreting results from evidence submissions

RESPONSIBILITY: Section analyst or designee

APPARATUS AND MATERIALS:

Materials

Aluminum stubs, 12mm diameter
Adhesive tabs

Equipment

Amray 1810 scanning electron microscope
PGT energy dispersive X-ray detector

PROCEDURES:

1. All proper documentation of the submission according to SOP GL 13.
2. All information pertaining to each item will be documented on the appropriate worksheet: QR Chern 01 or QR Chern 02.
3. Preparation: Samples are collected from the submitted evidence. Samples may be cuttings, shavings or neat materials which are deposited on the sticky surface of the SEM stub.

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4. SEMI-EDX Analysis - Before proceeding the examiner will run a QC (performance check) copper standard. The QC data will be placed into the QC logbook.

A. Sample Loading and analysis:

- 1) Depress VENT on the vacuum control panel.
- 2) Insert the sample into the specimen holder. To avoid contamination never touch the surface of the discs with bare hands, use tweezers around the stem of the stub to manipulate the discs. Once the stubs are all positioned properly, close the chamber, then depress EVACUATE on the vacuum control panel.
- 3) Wait for the green READY light. Then turn on the POWER at the main microscope console. Operating voltage, working distance, magnification and spot size on the SEM control panel are set to appropriate levels. Focus the microscope and adjust BRIGHTNESS and CONTRAST on the main SEM console to obtain a good picture.
- 4) Move the joystick to obtain a good overall view of the sample.
- 5) Using the status window, fill in the appropriate information and the analysis time.
- 6) Click on "x-ray display" and hit start
- 7) When the spectrum is completed, elemental composition can be obtained by using the auto-id feature or by picking elements via the periodic table feature.
- 8) Print the appropriate spectra

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- 9) Shut down the instrument and remove the sample disks

REFERENCES:

1. AMRAY Model 1810 operator's manual
2. PGT operator's manual

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