XRF training sessions
at Fischer 2012

X-ray Fluorescence Analysis training

- Understand the physical fundamentals of XRF
- Learn how to optimize measurement settings specifically for precious metal analysis to get best performance
- Gain confidence in analysis results by observing indicators of software feedback
- Practical exercises of challenging application cases
- Exchange experiences with specialists in the field

Fischer XRF training for assaying personnel and people working with precious metals

General Information

Possible Dates:	Weeks 41, 42 or 45
Duration:	3 days
Location:	Hünenberg, Switzerland (near Luzern)
Costs:	2900 €, including meals and accommodation
Teaching:	XRF specialists of Helmut Fischer Group
Attendees:	Assaying specialists 4 to max 8 individuals are admitted per course to guarantee optimal mentoring and sufficient time at the instrument
Certificate:	After examination, a certificate will be handed out specifying the topics addressed during the course
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Overview of XRF training schedule

- Main principles of X-rays and X-ray fluorescence
- Instrument hardware
- Analysis software
- Designing measurement applications
- Calibrations
- Judgment of the quality of an analysis
- Practical software features

Detailed Schedule

Principles of X-ray fluorescence

- Intuitive approach to the principle of X-ray fluorescence (XRF)
- Elements of an XRF spectrum and their origin (types of peaks, background, artefacts, etc.)
- Extracting concentration values from a spectrum (fundamental parameters, ROIs)

Exercises:

- Discussion of measured spectra (elements, quality of signals)
- Identify measuring ranges for a given material
- Estimate measurement uncertainties

Goal: Understand how a spectrum is formed and how analysis results can be extracted from a spectrum. Judge the signal quality in a spectrum.

Instrument hardware

- Discussion of the purpose of essential parts at an opened instrument
- XRF excitation conditions (voltages and primary filters)
- Connection between intensity, time and spot sizes for specific materials

Exercises:

- Experience the way different hardware options change the shape of the spectrum

Goal: Understand the impact of different parts of an instrument on the data the instrument provides. Know the possibilities of using hardware features to optimize the quality of raw-data.

Analysis software

- Internal structure of the program (DefMA, application, product, etc.)
- Structure of user interface

Designing measurement applications

- Strategies for creating DefMAs
- DefMA – types (analysis, thickness, ROI, etc.)
- Definition of the materials model (saturation thickness, layers, sheets, supports, etc.)
- Options: ROIs, Ratio method, measure elements, background corrections, etc.

Exercises:

- Create example DefMAs for various applications

Goal: Being able to define measurement applications with optimal settings.

Calibrations

- Fundamental parameters and / or calibrations
- Selecting optimal standards to calibrate an application for a certain range of values

Exercises:

- Single application with many standards vs. many applications with single standard

Goal: Being able to calibrate applications to achieve maximal accuracy

Judgment of the quality of an analysis

- Traces of erroneous measurements
- mq-values, quality of fit and repeatability
- General considerations on measurement uncertainty
- Instrument monitoring

Goal: Establish the ability to distinguish a correct from an erroneous analysis

Practical software features

- Automatic selection of measurement applications
- Multiple sample handling
- Evaluation of results (export, reporting)
- Working with limits and SPC's (option)
- 2D- and line-plots for homogeneity analysis (option)

Test

- Elements of XRF theory
- Estimate measuring ranges and uncertainties for a given application
- DefMAs: Choice of settings (hard-, software) for given analysis task
- Judgment of quality of analysis for given set of results

Daniel Sutter, Helmut Fischer AG, March 2012