

2018 Training Courses



HORIBA Scientific offers many types of training courses tailored to your particular requirements:

- **A la carte** training courses at our approved HORIBA Scientific training center. Learn and share your experience with other users and acquire the basics of the technique. You will be able to directly use this knowledge for your applications in your own laboratory.
- **Training on-site**, performed by one of our HORIBA Scientific application experts.

Our trainers are experts in each technique. They will provide trainings advice and guidance to make the most of your HORIBA Scientific instrument.

You will gain confidence and experience in the analysis of your samples.

To get the entire program and to get registered,
please contact us at

training.hfr@horiba.com

Certificates are given to every attendee for every course.

All trainings are held in France or at your location and are conducted in English.

Content

| | |
|--|----|
| Content | 3 |
| Calendar | 4 |
| Raman Microscopy for Beginners | 6 |
| Raman Options: DuoScan, Ultra Low Frequency, Particle Finder, TERS | 7 |
| Raman SERS | 8 |
| Raman Multivariate Analysis | 9 |
| Raman & SPM | 10 |
| Fluorescence for Beginners | 11 |
| Fluorescence - Software | 12 |
| Fluorescence Lifetime | 13 |
| Fluorescence Aqualog | 14 |
| Ellipsometry for Beginners | 15 |
| Ellipsometry : Advanced Modeling Techniques | 16 |
| SPRi - OpenPlex | 17 |
| SPRi - XelPlex | 18 |
| SPRi - Customer Training on their Applications | 19 |
| GDOES - Learn theory and practice | 20 |
| GDOES - Quantification | 21 |
| GDOES - DiP | 22 |
| ICP-OES | 23 |
| Particle Size Analyzer: Laser Diffraction | 24 |
| Particle Size Analyzer: Light Scattering Technique | 25 |
| C/S Analysis | 26 |
| O/N/H Analysis | 27 |
| S & Cl in Petroleum Products Analysis | 28 |
| XGT/MESA-50 | 29 |
| On-site Training | 30 |
| On-line Training | 31 |
| Practical information | 32 |
| Registration form | 34 |



For further information, contact:

Tel: + 33 (0) 1 69 74 72 00, Fax: + 33 (0) 1 69 09 07 21, training.hfr@horiba.com

Calendar

| Ref. | Duration | Training | February | March |
|---|----------|--|----------|-------|
| Raman | | | | |
| RAM1 | 3 days | Raman Microscopy for Beginners | 12-14 | |
| RAM1DS | 1 day | Raman DuoScan (option for RAM1) | 15 or 16 | |
| RAM1PF | 1 day | Raman Particle Finder (option for RAM1) | 15 or 16 | |
| RAM1TERS | 1 day | Raman TERS (option for RAM1) | 15 or 16 | |
| RAM1 ULF | 1 day | Raman Ultra Low Frequencies (option for RAM1) | 15 or 16 | |
| RAM2 | 1 day | Raman SERS | 15 | |
| RAM3 | 1 day | Raman Multivariate Analysis | 16 | |
| RAM4 | 3 days | Raman & SPM | 12-14 | |
| Fluorescence | | | | |
| FL1 | 3 days | Fluorescence for Beginners | | 19-21 |
| FL2 | 1 day | Fluorescence Software | | 22 |
| FL3 | 1 day | Fluorescence Lifetime | | 23 |
| FL4 | 1 day | Aqualog | | |
| Ellipsometry | | | | |
| ELL1 eng | 3 days | Ellipsometry for Beginners | | 26-28 |
| ELL2 eng | 3 days | Ellipsometry: Advanced Modeling Techniques | | |
| Surface Plasmon Resonance Imaging | | | | |
| SPRi1 | 3 days | SPRi - OpenPlex | 12-14 | |
| SPRi2 | 4 days | SPRi - XelPlex | | |
| SPRi3 | 4 days | SPRi - Customer Training on their Applications | | 12-15 |
| Glow Discharge Optical Emission Spectrometry | | | | |
| GD1 | 2 days | GDOES - Learn theory and practice | | |
| GD2 | 2 days | GDOES - Quantification | | |
| GD3 | 1 day | GDOES - DiP | | |
| Inductively Coupled Plasma | | | | |
| ICP | 5 days | ICP-OES | | 5-9 |
| Particle Size Analyzer | | | | |
| PSA1 | 1 day | Particle Size Analyzer: Laser diffraction | | 13 |
| PSA2 | 1 day | Particle Size Analyzer: Light Scattering Technique | | 14 |
| C/S/O/N/H Analyzer | | | | |
| HOR1 | 1 day | C/S Analyzer | | 13 |
| HOR2 | 1 day | O/N/H Analyzer | | 14 |
| S & Cl in Petroleum Products | | | | |
| HOR3 | 1 day | S & Cl Analyzer | | 15 |
| X-Ray Fluorescence | | | | |
| HOR4 | 1 day | XGT/MESA | | 16 |
| On line - On site training | | | | |



For further information, contact:

Tel: + 33 (0) 1 69 74 72 00, Fax: + 33 (0) 1 69 09 07 21, training.hfr@horiba.com

| April | May | June | July | September | October | November | December |
|------------|----------|------|-------|-----------|----------|----------|----------|
| | | | | | | | |
| | 14-16 | | 10-11 | | 8-10 | 19-21 | |
| | 17 or 18 | | | | 11 or 12 | | |
| | 17 or 18 | | | | 11 or 12 | | |
| | 17 or 18 | | | | 11 or 12 | | |
| | 17 or 18 | | | | 11 or 12 | | |
| | | | 12 | | | 22 | |
| | | | 13 | | | 23 | |
| | 14-16 | | | | | 19-21 | |
| | | | | | | | |
| | 28-30 | | | | 15-17 | | |
| | 31 | | | | 18 | | |
| | | 1 | | | 19 | | |
| 3 | | 4 | | | 22 | | |
| | | | | | | | |
| | | | | | | 19-21 | |
| | | 5-7 | | | | | 3-5 |
| | | | | | | | |
| | | | 2-4 | | | | |
| | 14-17 | | | | 22-25 | | |
| | | | | 10-13 | | | |
| | | | | | | | |
| 9- 10 | | | | | | 5 - 6 | |
| 11- 12 | | | | | | 7 - 8 | |
| 13 | | | | | | 9 | |
| | | | | | | | |
| | | | | | 15-19 | | |
| | | | | | | | |
| | | | | | 8 | | |
| | | | | | 9 | | |
| | | | | | | | |
| | | | | | 1 | | |
| | | | | | 2 | | |
| | | | | | | | |
| | | | | | 3 | | |
| | | | | | | | |
| | | | | | 4 | | |
| On Request | | | | | | | |



For further information, contact:

Tel: + 33 (0) 1 69 74 72 00, Fax: + 33 (0) 1 69 09 07 21, training.hfr@horiba.com

Raman Microscopy for Beginners

■ Reference: RAM1

■ Duration: 3 days

■ Dates: February 12-14, 2018
May 14-16, 2018
July 10-11, 2018
October 8-10, 2018
November 19-21, 2018

■ Who should attend

Users of HORIBA Scientific Raman spectrometers

■ From Monday 9 am to Wednesday 5:30 pm

Objectives

- Acquire theoretical and practical knowledge on Raman spectrometers
- Learn how to use the software
- Learn methodology for method development and major analytical parameters
- How to set up an analytical strategy with an unknown sample
- How to interpret results
- Learn how to follow the performances of the Raman spectrometer over the time.

Can be
followed by DuoScan,
Particle Finder, TERS &
ULF trainings

Program

Day 1

- The theory of the Raman principle
- Raman Instrumentation
- Practical session – System and software presentation, Acquisition Parameters:
 - LabSpec 6 presentation and environment: user accounts, file handling, display of data, basic functions
 - Set up of acquisition parameters and single spectra measurement
 - Templates & Reports

Day 2

- Analysis of Raman spectra
- Practical session: Raman spectrum measurement and Database Search
 - Optimization of the parameters: how to chose the laser, the grating, the confocal hole, the laser power
 - How to use the polarization options
 - Library Search using KnowItAll software
 - How to create databases

Raman imaging

- How to make a Raman image (1D, 2D and 3D)
- Data evaluation: cursors, CLS fitting, peak fitting
- Image rendering, 3D datasets
- Fast mapping using SWIFT XS

Day 3

Data processing

- Processing on single spectra and datasets
- Baseline correction
- Smoothing
- Normalization
- Spectra subtraction, averaging
- Data reduction
- Methods
- Practical exercises

Customer samples: Bring your own samples!



For further information, contact:

Tel: + 33 (0) 1 69 74 72 00, Fax: + 33 (0) 1 69 09 07 21, training.hfr@horiba.com

Raman Options: DuoScan, Ultra Low Frequency, Particle Finder, TERS

■ Duration: 1 day

■ Dates: February 15 or 16, 2018
May 17 or 18, 2018
October 11 or 12, 2018

■ Who should attend

Users of HORIBA Scientific Raman spectrometers who already understand the fundamentals of Raman spectroscopy and know how to use HORIBA Raman system and LabSpec Software. It is advised to participate in the basic Raman training first (RAM1).

■ From 9:00 am to 5:30 pm

Objectives

Acquire technical skills on DuoScan, Ultra Low Frequency (ULF), Particle Finder or TERS.

Program

■ Reference: RAM1DS

Introduction to DuoScan

- Principle and hardware

DuoScan Macrospot

- Practical examples

DuoScan MacroMapping

- Practical examples

DuoScan Stepping Mode

- Practical examples

Customer samples: Bring your own samples!

■ Reference: RAM1ULF

Presentation of the ULF kit

- Principle and requirements
- Application examples

Installation of the ULF kit

■ Reference: RAM1PF

Introduction to Particle Finder

- Principle and requirements

Practical session

- Demo with known sample
- Customer samples: Bring your own samples!

Practical session

- Demo with known samples

Customers samples: Bring your own samples!

■ Reference: RAM1TERS

Presentation of the TERS technique

- Principle and requirements
- Application examples

Demo TERS

- Presentation of the different tips and SPM modes
- Laser alignment on the tip
- TERS spectra and TERS imaging on known samples

Practical session

- Hands-on on demo samples (AFM mode)
- Laser alignment on the tip
- TERS spectra and TERS imaging on known samples



For further information, contact:

Tel: + 33 (0) 1 69 74 72 00, Fax: + 33 (0) 1 69 09 07 21, training.hfr@horiba.com

Raman SERS

■ Reference: RAM2

■ Duration: 1 day

■ Dates: February 15, 2018
July 12, 2018
November 22, 2018

■ Who should attend

Users of HORIBA Scientific Raman spectrometers who already understand the fundamentals of Raman spectroscopy and know how to use HORIBA Raman system and labSpec Software. It is advised to participate in the basic Raman training first.

■ From 9 am to 5:30 pm

Objectives

- Acquire theoretical and practical knowledge on SERS (Surface Enhanced Raman Spectroscopy)
- Know how to select your substrate
- Interpret results

Program

Introduction to SERS

Presentation of the SERS technique

- Introduction: Why SERS?
- What is SERS?
- Surface Enhanced Raman basics
- SERS substrates

Introduction to the SERS applications

- Examples of SERS applications
- Practical advice
- SERS limits

Demo on known samples

Customer samples: Bring your own samples!



Raman Multivariate Analysis

■ Reference: RAM3

■ Duration: 1 day

■ Dates: February 16, 2018
July 13, 2018
November 23, 2018

■ Who should attend

Users of HORIBA Scientific Raman spectrometers who already understand the fundamentals of Raman spectroscopy and know how to use HORIBA Raman system and LabSpec Software. It is advised to participate in the basic Raman training first (RAM1).

■ From 9 am to 5:30 pm

Objectives

- Understand the Multivariate Analysis module
- Learn how to use Multivariate Analysis for data treatment
- Perform real case examples of data analysis on demo and customer data

Program

Introduction to Multivariate Analysis

- Univariate vs. Multivariate analysis
- Introduction to the main algorithms: decomposition (PCA and MCR), classification and quantification (PLS)

Practical work on known datasets (mapping)

- CLS, PCA, MCR

Introduction to classification

- HCA, k-means
- Demo with known datasets

Introduction to Solo+MIA

- Presentation of Solo+MIA
- Demo with known datasets



For further information, contact:

Tel: + 33 (0) 1 69 74 72 00, Fax: + 33 (0) 1 69 09 07 21, training.hfr@horiba.com

Raman & SPM

■ Reference: RAM4

■ Duration: 3 days

■ Dates: February 12-14, 2018
May 14-16, 2018
November 19-21, 2018

■ Who should attend

Scientists, engineers, technicians, Ph.D. students who have already acquired good skills in Raman spectroscopy or SPM.

■ From 9 am to 5:30 pm

Objectives

- Understand Raman spectroscopy and SPM techniques
- Understand coupling principles: Make a difference between colocalized and TERS measurements
- Learn how to perform colocalized measurements

Program

Day 1

Introduction to Raman spectroscopy

- Basic principle and advantages of raman spectroscopy
- Instrumentation

Practical session

- Optimization of the parameters: How to choose the laser, the grating, the confocal hole, the laser power
- How to make a Raman image (2D)
- Data evaluation: cursors, CLS fitting, peak fitting
- Fast mapping using SWIFT XS

Objective: Being able to select the good parameters for Raman imaging and to perform data process

Introduction to Scanning Probe Microscopy (SPM)

- Instrumentation
- The different modes (AFM, STM, Tuning Fork) and signals (Topography, Phase, KPFM, C-AFM, MFM, PFM)

Practical session

- Tips and sample installation
- Molecular resolution in AFM tapping mode
- Measurements in AC mode, contact mode, I-top mode, KPFM
- Presentation of the dedicated tips and additional equipment
- Objective: Being able to use the main AFM modes and optimize the parameters

Day 2

TERS introduction

- Principle and requirements
- Presentation of the different TERS tips (STM-TERS Au, AFM-TERS Au and AFM-TERS Ag)
- Excitation laser alignment on the TERS tip (rough and fine alignment)
- TERS demonstration on carbon nanotubes and graphene oxide flakes
- Optimization of the TERS parameters (spectra and imaging)

Practical session

- Hands-on on demo samples (AFM mode)
- Laser alignment on the tip
- TERS spectra and TERS imaging on known sample

Day 3

TERS Hands-on

- TERS measurements, from AFM-TERS tip installation to TERS mapping.
- TERS measurements on end users samples.

Bring your own samples!



For further information, contact:

Tel: + 33 (0) 1 69 74 72 00, Fax: + 33 (0) 1 69 09 07 21, training.hfr@horiba.com

Fluorescence for Beginners

■ Reference: FL1

■ Duration: 3 days

■ Dates: March 19-21, 2018
May 28-30, 2018
October 15-17, 2018

■ Who should attend

Beginners in Fluorescence measurements.

■ From 9 am to 5:30 pm

Objectives

- Acquire theoretical and practical knowledge on fluorescence spectrometers
- Learn how to use the software
- Acquire methodology for method development
- Learn how to set up an analytical strategy with an unknown sample
- Learn how to interpret results
- Learn how to follow the performance of the spectrometer over the time

Program

Day 1

The Theory of the Fluorescence Principle

- Why and where fluorescence is used. Application review.
- Fluorescence Instrumentation – presentation of the different parts of the instrument and their roles.
- How to select the spectrofluorometer according to the application needs.
- Practical session – System and software presentation, Acquisition Parameters
 - FluorEssence Software presentation and environment: acquisitions modules, files handling, display of data, basic functions
 - Set up of acquisition parameters and single spectra measurement

Day 2

Focus on Fluorescence Lifetime

Acquisitions: Theory

- Review of the existing methods to estimate the Fluorescence lifetime
- Fluorescence lifetime instrumentation – presentation of the different parts of the instrument and their role

- How to select the spectrofluorometer according to the application needs.
- Practical session – System and software presentation, Acquisition Parameters
 - DataStation Software presentation and environment: Acquisitions modules, file handling, display of data, basic functions
 - Fluorescence decay analysis

Day 3

Focus on Specific Measurements

- Polarization and anisotropy: theory and applications
- Matrix scan: Excitation Emission Matrix benefits (EEM)
- Time-resolved Emission Spectra (TRES): How to estimate the emission spectra during the de-excitation process
- Practical session:
 - Polarization acquisitions: parameters and spectral analysis
 - How to run an anisotropy decay and what information that can be extracted
 - TRES: Set up of acquisition parameters and data treatment



For further information, contact:

Tel: + 33 (0) 1 69 74 72 00, Fax: + 33 (0) 1 69 09 07 21, training.hfr@horiba.com

Fluorescence - Software

■ Reference: FL2

■ Duration: 1 day

■ Date: March 22, 2018
May 31, 2018
October 18, 2018

■ Who should attend

Existing customers of HORIBA spectrofluorometers

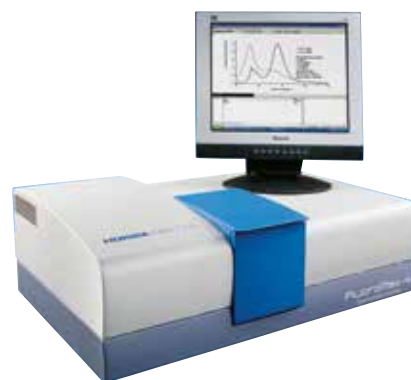
■ From: 9 am to 5:30 pm

Objectives

- Learn how to use the software
- Perform real case examples on demo and customer data

Program

- Introduction to the software
- Practical work on known datasets
- Practical work on customer data



For further information, contact:

Tel: + 33 (0) 1 69 74 72 00, Fax: + 33 (0) 1 69 09 07 21, training.hfr@horiba.com

■ Reference: FL3

■ Duration: 1 day

■ Date: March 23, 2018
June 1, 2018
October 19, 2018

■ Who should attend

Existing customers (beginners-intermediate users) of HORIBA spectrofluorometers

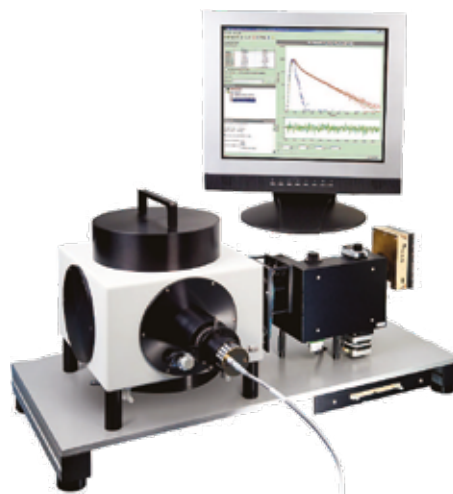
■ From 9 am to 5:30 pm

Objectives

- Acquire theoretical and practical knowledge on lifetime fluorescence
- Learn how to use the software
- Acquire methodology for method development
- Learn how to set up an analytical strategy with an unknown sample
- Learn how to interpret results

Program

- Description of the technique
- Use and advantages
- Basic time-resolved measurements
- Advanced time-resolved measurements (FRET, TR anisotropy)



For further information, contact:

Tel: + 33 (0) 1 69 74 72 00, Fax: + 33 (0) 1 69 09 07 21, training.hfr@horiba.com

Aqualog

■ Reference: FL4

■ Duration: 1 day

■ Date: April 3, 2018
June 4, 2018
October 22, 2018

■ Who should attend

Existing customers having a HORIBA spectrofluorometer

■ From 9 am to 5:30 pm

Objectives

- Acquire theoretical and practical knowledge on Aqualog fluorescence
- Discover Excitation Emission Matrix (EEM): Benefits vs. the standard spectral analysis
- EEMs applications and uses

Program

- Introduction to EEMs (Excitation-Emission Matrices)
- Data treatment: Chemometrics approach
- Description of the instrument (optics, configuration)
- Introduction to advanced techniques (Quantum Yield)
- Practical Session - hands on use of the Aqualog instrument
 - Parameters setup
 - Data analysis



Ellipsometry for Beginners

■ Reference: ELL1eng

■ Duration: 3 days

■ Dates: March 26-28, 2018
November 19-21, 2018

■ Who should attend

New users of HORIBA ellipsometers

■ From 9 am to 5 pm

Objectives

- Provides a thorough background in the basic ellipsometry theory and focus on modeling techniques with a large variety of hands-on sample analysis.
- Use of the ellipsometer and DeltaPsi2 software through a large variety of hands-on sample analysis.

Program

Day 1

Theory and Practical Session

- Ellipsometry theory
- Instrumentation
- Overview of modeling process
- Description of main functions of DeltaPsi2 software & hands on the ellipsometer
- Procedure to check the system before to perform measurements
- Measurement and modeling of transparent films on opaque substrates

Day 2

Practical Session & Software Use

- Sample analysis of semi-absorbing thin films in monolayers and multilayers of opaque substrate
- EMA, Roughness
- Sample analysis of glass substrate
- Sample analysis of semi-absorbing thin films on glass
- Sample analysis of absorbing films
- Dispersion formulae parameterization
- Sample analysis of thickness of non-uniform layers

Day 3

Practical Session: Customer Samples



For further information, contact:

Tel: + 33 (0) 1 69 74 72 00, Fax: + 33 (0) 1 69 09 07 21, training.hfr@horiba.com

Ellipsometry : Advanced Modeling Techniques

■ Reference: ELL2 eng

■ Duration: 3 days

■ Dates: June 5-7, 2018
December 3-5, 2018

■ Who should attend

Advanced users. A level of knowledge equivalent to Level ELL1 is required

■ From 9 am to 5:30 pm

Objectives

This training course target advanced users, with a level of knowledge equivalent to ELL1. Attendees should have at least some ellipsometry experience and skill with DeltaPsi2 software.

- Provides a good practice of modeling methods used for the characterization of complex structures such as: unknown materials, ultra thin films, anisotropic samples, limited backside reflection parameterization, etc. Customers are invited to bring samples.

Program

Day 1

Practical Session of Non-ideal Samples: Measurements and Modeling

- Review of theory
- Analysis of gradient layer
- Analysis of thick films $>2\mu\text{m}$
- Non-uniform thicknesses
- Study of depolarizing sample

Day 2

Practical Session of Non-ideal Samples

- Analysis of combined ellipsometric and transmission data for thin metallic films sample
- Anisotropy: learn how to identify the axis orientation to run appropriate measurements for modeling

Day 3

Practice session - Customer samples



■ Reference: SPR1

■ Duration: 3 days

■ Dates: January 12-14, 2018
July 2-4, 2018

■ Who should attend

OpenPlex users or people wishing to acquire an OpenPlex

■ From 9 am to 5 pm

Objectives

- Learn how to optimize the experimental conditions according to the interaction to be analyzed
- Learn how to make biochip spotting
- Master the use of OpenPlex
- Learn how to analyze a kinetic data

Program

Day 1

- Introduction to kinetics of interaction: What is a «good» kinetic?
- Which biochip to choose according to the molecules to immobilize?
- How to optimize spotting (concentrations, buffers, reference, ...)?
- The important experimental parameters to be tested for SPRi (pH, stroke buffer, temperature, ...)
- Advice to be applied during the realization of the experiment (duration of kinetics, flow rate, regeneration, ...)
- Case studies

Day 2

- Choose the right surface chemistry as a function of immobilized ligands
- Optimize experimental immobilization conditions (spotting buffer, pH, ligand concentration, duration of needle rinses / dryings, etc.)
- Master the different steps to program a spotting matrix*
- Perform spottings

Day 3

- Optimize the SPRi experimental conditions according to the interaction to be analyzed
- Master the use of OpenPlex
- Two models of interactions will be studied:
 - Study of a first interaction (protein / protein)
 - Study of a second interaction (DNA / DNA)
- Analysis of the data, and description of the different analysis software.

*The choice of the spotter used must be defined when registering



For further information, contact:

Tel: + 33 (0) 1 69 74 72 00, Fax: + 33 (0) 1 69 09 07 21, training.hfr@horiba.com

SPRi - XelPleX

■ Reference: SPRi2

■ Duration: 4 days

■ Dates: May 14-17, 2018
October 22-25, 2018

■ Who should attend

XelPleX users or people wishing to acquire an XelPleX

■ From 9 am to 5 pm

Objectives

- Learn how to optimize the experimental conditions according to the interaction to be analyzed
- Learn how to make a biochip spotting
- Master the use of XelPleX
- Learn how to analyze a kinetic data

Program

Day 1

- Introduction to kinetics of interaction: What is a «good» kinetic?
- Which biochip to choose according to the molecules to immobilize?
- How to optimize spotting (concentrations, buffers, reference, ...)?
- The important experimental parameters to be tested in SPRi (pH, running buffer, temperature,...)
- Advice to be applied during the realization of the experiment (duration of kinetics, flow rate, regeneration, ...)
- Case studies

Day 2

- Choose the right surface chemistry as a function of immobilized ligands
- Optimize experimental immobilization conditions (spotting buffer, pH, ligand concentration, duration of needle rinses / dryings, etc.)
- *Master the use of the spotter (master the different steps to program a spotting matrix)
- Performing spottings

Day 3

- Optimize the experimental conditions according to the interaction to be analyzed
- Master the use of XelPleX
- Two models of interactions will be studied:
 - Study of a first interaction (protein / protein)
 - Study of a second interaction (DNA / DNA)

Day 4

- Reminder on interaction kinetics
- Use of EzFit software. Analysis of different interactions (Ac / Ac, DNA / DNA, Protein / small molecule, ...)
- Carrying out analysis in «classical» mode (injection of several concentrations of the analyte) and in «single-injection» mode (injection of a single concentration of the analyte)

*The choice of the spotter used must be defined when registering



For further information, contact:

Tel: + 33 (0) 1 69 74 72 00, Fax: + 33 (0) 1 69 09 07 21, training.hfr@horiba.com

SPRI - Customer Training on their Applications

■ Reference: SPRI3

■ Duration: 4 days

■ Dates: March 12-15, 2018
September 10-13, 2018

■ Who should attend

XelPleX or OpenPlex users

People wishing to acquire an XelPleX or an OpenPlex
For this training the attendees should be from the same team

■ From 9 am to 5 pm

Objectives

- Learn how to optimize experimental conditions in function of interactions to analyze
- Learn how to spot the biochip with the spotter defined by the user
- Master the use of the SPRI system, defined beforehand by the user
- Learn how to analyze data

Program

Day 1

- Which biochip to choose according to the molecules to immobilize?
- How to optimize spotting (concentrations, buffers, reference, ...)?
- The important experimental parameters to be tested for SPRI (pH, running buffer, temperature, ...)
- Advice to be applied during the experiment (duration of kinetics, flow rate, regeneration, ...)
- Establishment of an experimental protocol

Day 2

- Choose suitable surface chemistry for immobilized ligands
- Perform spotting based on the previously defined protocol
- Advice about the maintenance of the instrument

Day 3

- Carry out the SPRI experiment as described in the protocol
- Master the use of the chosen SPRI device (XelPleX or OpenPlex)

Day 4

- Reminder on interaction kinetics
- Software use
- Data analysis



For further information, contact:

Tel: + 33 (0) 1 69 74 72 00, Fax: + 33 (0) 1 69 09 07 21, training.hfr@horiba.com

GDOES: Learn theory and practice

■ Reference: GD1

■ Duration: 2 days

■ Dates: April 9-10, 2018
November 5-6, 2018

■ Who should attend

Users of HORIBA Scientific GD spectrometers

■ From 9 am to 5:30 pm

Objectives

The goals of this training are to:

- To know how to optimize the instrumental parameters,
- Quickly use the software,
- Master a calibration in bulk and on surface,
- Perform an analysis of unknown samples,

- Know the accessories,
- Know how to perform a diagnosis of the instrument.

This program can be amended based on the requests of the customers present. Moreover, customers are invited to bring samples.

Program

Day 1

General Presentation of the GD Technique and the Instrument

- Principles of GD plasma
- Principles of optics and emission spectrometry
- Description of the instrument
- Overview of the software
- Hands-on practical experiments: Analysis of various samples, influence of operating parameters (pressure, power, duty cycle, etc), HDD mode.
- Procedure for daily check up

Day 2

Operation of the Instrument, Focus on Software

- Sample analysis with treatment of data
- Method creation
- Use of the monochromator
- Image mode
- Export/Import – data exchange

Introducing advanced properties

UFS, newly patented, plasma cleaning, etc.

Maintenance

GDOES: Quantification

■ Reference: GD2

■ Duration: 2 days

■ Dates: April 11-12, 2018
November 7 -8 2018

■ Who should attend

Users of GDOES HORIBA spectrometers who have already done GD1 training or who are confirmed GD users.

■ From 9 am to 5:30 pm

Objectives

- Learn the various quantification modes in GDOES

Program

Day 1

Principle of Quantification

- Speed of erosion and calibration
- Principles of deep calibration
- Examples of calibration, use of multi-layer sample, recalibration and verification

Day 2

Practical handling

- Sample analysis and quantification



For further information, contact:

Tel: + 33 (0) 1 69 74 72 00, Fax: + 33 (0) 1 69 09 07 21, training.hfr@horiba.com

GDOES: DiP

■ Reference: GD3

■ Duration: 1 Day

■ Dates: April 13, 2018
November 9, 2018

■ Who should attend

Users of GDOES HORIBA spectrometers who have already done GD1 training or who are confirmed users of GD.

■ From: 9 am to 5:30 pm

Objectives

- Learn how to measure thicknesses and evaluate erosion rates

Program

- Introducing DiP's principle
- Sample analysis



For further information, contact:

Tel: + 33 (0) 1 69 74 72 00, Fax: + 33 (0) 1 69 09 07 21, training.hfr@horiba.com

■ Reference: ICP

■ Duration: 5 days

■ Dates: March 5-9, 2018
October 15 -19, 2018

■ Who should attend

Users of HORIBA Scientific ICP-OES spectrometers

■ From 9 am to 5:30 pm

Objectives

- A theoretical and practical knowledge on ICP-OES spectrometers
- Learn how to use the software (latest version used in the laboratory)
- Learn methodology for method development and major analytical parameters
- Know how to set up an analytical strategy with an unknown sample
- Interpret results
- Follow the performances of the ICP-OES spectrometer over the time
- Identify dysfunctions and their origins, and solve these dysfunctions

Program

Day 1

Theory

- Theory of ICP-OES
- Principle and Instrumentation
- Method development strategy
- Wavelength selection
- Optimization of parameters
- Spectral interferences
- Analytical performances

- Semi-quantitative analysis
- Slit selection.

Day 4

Practical: Analytical Performance

- Background position
- Detection limit calculation
- Spectral interferences
- Matrix effect

Day 2

Practical: Method Creation and Optimization

- Method creation
- Optimization of gas flow
- Optimization of sheath gas
- Optimization of integration time

Day 5

Analysis of Unknown Sample

- Discussion

Day 3

Practical: Method Creation and Optimization

- Method development
- Wavelength selection
-



For further information, contact:

Tel: + 33 (0) 1 69 74 72 00, Fax: + 33 (0) 1 69 09 07 21, training.hfr@horiba.com

Particle Size Analyzer: Laser Diffraction

■ Reference: PSA1

■ Duration: 1 day

■ Dates: March 13, 2018
October 8, 2018

■ Who should attend

Users of Laser Diffraction Analyzers LA 300, LA350, LA950, LA960 Analyzers

■ From 9 am to 5:30 pm

Objectives

- Acquire theoretical and practical knowledge on the particle size analyzer
- Learn how to optimize operating conditions for any sample

Program

Laser Diffraction Theory

- Description of optical configuration & hardware
- Fraunhofer and Mie theory
- Refractive Index (RI) definition and optimization, mathematical data treatment
- Results and interpretation (distribution base (volume, number, surface), description of typical statistical parameters (D10, D50, D90, Mode, std, D43....))

Presentation of the unit with its different parts and accessories demonstrating associated applications.

Software

- Installation
- Software description for quick handling
- How to create SOP and check reference materials
- How to create a standard SOP
- Method (SOP) set up on customer samples

Importance of sample preparation (sampling, sample predispersion)

Choice of Analytical Conditions and Optimisation

- Pump speed/stirrer speed (wet mode), Pressure / feeder vibration (dry mode)
- Acquisition time
- Concentration
- Ultrasonics: internal/external use
- Refractive index selection and optimization

Results interpretation (fit optimization, right size parameters selected regarding sample distribution, etc.)

Data exportation and setup

Specific software functions

Hands-on with Common Samples such as:

- Colored samples
- Dense materials
- Polydisperse & multimodal samples
- Granulated formulations / friable samples
- Emulsions

Maintenance of First Level

Particle Size Analyzer: Light Scattering Technique

■ Reference: PSA2

■ Duration: 1 day

■ Dates: March 14, 2018
October 9, 2018

■ Who should attend

Users equipped with a DLS analyzer, Camsizer P4 or Camsizer XT

■ From 9 am to 5:30 pm

Objectives

- Learn how to set up good conditions to properly run a sample
- How to interpret results in DLS

Program

Dynamic Light Scattering Theory

- Principle
- Description of optical configuration & hardware
- Parameters necessary to set up and influence result
- Cumulant method and histogram method
- Results and interpretation (distribution base (Intensity, volume, number), description of typical statistical parameters (Zave, PI, mean size, mode, std)
- Zeta potential principle (DLVO approach)
- Henry equations (models available: Schmolukovski, Huckel...)
- Molecular weight measurement (Debye plot)

Presentation of the unit with its different parts and accessories demonstrating associated applications

Software

- Installation
- Software description for quick handling
- How to create SOP and check reference materials
- How to create a standard SOP

Method (SOP) set up on customer samples

Importance of sample preparation

Choice of Analytical Conditions and Optimisation

- Media RI and viscosity set up
- Detector angle selection / attenuation filters
- Correlator set up
- Measurement acquisition time
- Model of computation
- Result display configuration (Intensity base, volume base, etc.)

Results interpretation (fit optimization, and data evaluation and treatment)

Data exportation and setup and recomputation

Hands on with Common Samples such as :

- Diluted and concentrated samples
- Broad size distribution samples
- Very small sample sizes (< 10nm)
- Proteins approach
- Emulsions
- Powders approach

Maintenance of First Level



For further information, contact:

Tel: + 33 (0) 1 69 74 72 00, Fax: + 33 (0) 1 69 09 07 21, training.hfr@horiba.com

C/S Analyzer

■ Reference: HOR1

■ Duration: 1 day

■ Dates: March 13, 2018
October 1, 2018

■ Who should attend

Users of the EMIA C/S analyzer

■ From 9 am to 5:30 pm

Objectives

- Acquire a detailed knowledge of the Carbon/Sulfur analyzers principle
- Learn how to use the EMIA for typical analysis (software, conditions, sample preparation)
- Learn how to optimize the conditions for dedicated applications
- Review of all maintenance for optimum use of the instrument

Program

- Principle of the C/S analyzer
- Specific features of the EMIA
- Software presentation:
 - Preventive maintenance
 - Interactive maintenance
 - Measurement
 - Data processing
- Programmable temperature curves
- Different accelerators: advantages/disadvantages
- Purificator principle and interest
- Analytical sequences
- Methods optimization
- Review of various applications methods
- Review of good analytical practices



■ Reference: HOR2

■ Duration: 1 day

■ Dates: March 14, 2018
October 2, 2018

■ Who should attend

Users of the EMGA O/N/H analyzer

■ From 9 am to 5:30 pm

Objectives

- Acquire a detailed knowledge of the Oxygen/Nitrogen/Hydrogen analyzers principle
- Learn how to use the EMGA for typical analysis (software, conditions, sample preparation)
- Learn how to optimise the conditions for dedicated applications
- Review of all maintenance for optimum use of the instrument

Program

- Principle of O/N/H analyzers
- Description of the different EMGA's modules
- Specificity of the double introduction system
- Different flux: Advantages/disadvantages
- Software presentation:
 - Preventive maintenance
 - Measurement
 - Data processing
- Programmable temperature curves
- Purifier principle and interest
- Different crucible types: description and use
- Detectors: principle and description
- Analytical sequences
- Methods optimization
- Review of various applications methods
- Few reminders on good analytical practice
- Sample preparation



For further information, contact:

Tel: + 33 (0) 1 69 74 72 00, Fax: + 33 (0) 1 69 09 07 21, training.hfr@horiba.com

S & Cl in Petroleum Products Analyzer

■ Reference: HOR3

■ Duration: 1 day

■ Dates: March 15, 2018
October 3, 2018

■ Who should attend

Users of SLFA, MESA-6000/7220.

■ From 9 am to 5:30 pm

Objectives

- Acquire a detailed knowledge of the EDXRF principle for Sulfur and Chlorine determination in petroleum products
- Learn how to use the SLFA and/or MESA-7220
- Learn how to calibrate the SLFA/MESA-7220
- Review of maintenance for optimum use of the instrument

Program

- General presentation of the EDXRF (Energy Dispersive X-Ray Fluorescence)
- Specificity of the EDXRF for Sulfur and Chlorine determination in petroleum products
- Description and specificity of the different instruments
- Sample preparation
- Software (review of the different menus)
- Optimization of the conditions depending on the samples
- Maintenance
- Review of good analytical practice



■ Reference: HOR4

■ Duration: 1 day

■ Dates: March 16, 2018
October 4, 2018

■ Who should attend

Users of the XGT/Mesa-50 X-Ray Fluorescence Analyzer

■ From 9 am to 5 pm

Objectives

- Acquire a detailed knowledge of the principle of the XGT/MESA-50 analyzers
- Learn how to use the XGT/MESA-50 for WEEE/RoHS analysis
- Learn how to use the XGT/MESA-50 and optimize the conditions for an unknown sample
- Review of maintenance for optimum use of the instrument

Program

- General presentation of the XRF instruments' range
- Principle of Dispersive X-Ray Fluorescence
- Description of the different elements of the instruments (X-Ray tube, detector, collimators, filters, camera, etc.)
- Software: Complete review of different menus (depending on instruments and software version)
 - How to run a WEEE/RoHS measurement
 - How to run an unknown sample
 - Qualitative and quantitative analysis
 - Data reporting
- Different examples of applications
- Maintenance review
- Thickness measurements software (option)
- Sample preparation and set up
- Accessories: Review of the different accessories and options



For further information, contact:

Tel: + 33 (0) 1 69 74 72 00, Fax: + 33 (0) 1 69 09 07 21, training.hfr@horiba.com

On-site Training

■ Reference: TRAINSITE

■ Duration: Mutually agreed

■ Dates: By appointment

Objectives

- Basic training on techniques (ICP-OES, GDOES, PP-TOFMS, SPRI, Ellipsometry, Raman, Fluorescence ...)
- Presentation and use of the specific software
- Use of accessories

Program

Schedule of On-site Training (Example)

- Daily use of the instrument (start up, checking, routine analysis)
- Software review
- Maintenance
- Operating conditions optimization

Agenda is discussed and prepared by mutual agreement



For further information, contact:

Tel: + 33 (0) 1 69 74 72 00, Fax: + 33 (0) 1 69 09 07 21, training.hfr@horiba.com

■ Reference: TRAINLINE

■ Duration: 4 hours divisible

■ Dates: by appointment

■ Who should attend

All users of HORIBA analyzers equipped with internet access

Objectives

Training or analytical assistance on any kind of instrument commercialized by HORIBA Scientific with the possibility to use the 4 hour package in modules (30 minutes minimum each)

Program

To be defined when making the appointment

Prerequisite

A first connection (free of charge) will be done to ensure that the connection works properly

Packaging use follow up

An e-mail will be sent to the customer after each connection to keep him informed about time remaining in his package



For further information, contact:

Tel: + 33 (0) 1 69 74 72 00, Fax: + 33 (0) 1 69 09 07 21, training.hfr@horiba.com

Practical information

Courses range from basic to advanced levels and are taught by application experts. The theoretical sessions aim to provide a thorough background in the basic principles and techniques. The practical sessions are directed at giving you hands-on experience and instructions concerning the use of your instrument, data analysis and software. We encourage users to raise any issues specific to their application. At the end of each course a certificate of participation is awarded.

Standard, customized and on-site training courses are available in France, Germany, USA and also at your location.

Dates mentioned here are only available for HORIBA France training center.

Registration

Fill in the form and:

- Email it to: training.hfr@horiba.com
- Or Fax it to: +33 (0)1 69 09 07 21
- More information: Tel: +33 (0)1 69 74 72 00

General Information

The invoice is sent at the end of the training. A certificate of participation is also given at the end of the training.

We can help you book hotel accommodations. Following your registration, you will receive a package including training details and course venue map. We will help with invitation letters for visas, but HORIBA FRANCE is not responsible for any visa refusal.

Pricing

Refreshments, lunches during training and handbook are included.

Hotel transportation, accommodation and evening meals are not included.

Location

Depending on the technique, there are three locations: Longjumeau (France, 20 km from Paris), Palaiseau (France, 26 km from Paris), Villeneuve d'Ascq (France 220 km from Paris) or at your facility for on-site training courses. Training courses can also take place in subsidiaries in Germany or in the USA.

Access to HORIBA FRANCE, Longjumeau

HORIBA FRANCE SAS
16 - 18 rue du canal
91165 Longjumeau - FRANCE

Depending on your means of transport, some useful information:

- if you are arriving by car, we are situated near the highways A6 and A10 and the main road N20
- if you are arriving by plane or train, you can take the train RER B or RER C that will take you not far from our offices. (Around 15 €, 150 € by taxi from Charles de Gaulle airport, 50 € from Orly airport).

We remain at your disposal for any information to access to your training place. You can also have a look at our web site at the following link:

<http://www.horiba.com/scientific/contact-us/france/visitors-guide/>

Access to HORIBA FRANCE, Palaiseau

HORIBA FRANCE SAS
Passage Jobin Yvon, Avenue de la Vauve,
91120 Palaiseau - FRANCE

From Roissy Charles de Gaulle Airport By Train

- Take the train called RER B (direction Saint Remy Les Chevreuse) and stop at Massy-Palaiseau station
- At Massy-Palaiseau station, take the Bus 91-06 C or 91-10 and stop at Fresnel
- The company is a 5 minute walk from the station, on your left, turn around the traffic circle and you will see the HORIBA building



For further information, contact:

Tel: + 33 (0) 1 69 74 72 00, Fax: + 33 (0) 1 69 09 07 21, training.hfr@horiba.com

Around 150 € by taxi from Charles de Gaulle airport.

From Orly Airport By Train

- At Orly airport, take the ORLYVAL, which is a metro line that links the Orly airport to the Antony RER station
- At Antony station, take the RER B (direction St Remy Les Chevreuse) and stops at Massy-Palaiseau station
- At Massy-Palaiseau station, take the Bus 91-06 C, 91-06 B or 91-10 stop at Fresnel
- The company is 5 minutes walk from the station, on your left, turn around the traffic circle and you will see the HORIBA building
- Or at Orly take the Bus 91-10 stop at Fresnel. The company is 5 minutes walk from the station, on your left, turn around the traffic circle and you will see the HORIBA building. We remain at your disposal for any information to access to your training place. You can also have a look at our web site at the following link:

<http://www.horiba.com/scientific/contact-us/france/visitors-guide/>

Around 50 € by taxi from Orly airport.

Access to HORIBA FRANCE, Villeneuve d'Ascq

HORIBA Jobin Yvon SAS
231 rue de Lille,
59650 Villeneuve d'Ascq - FRANCE

By Road from Paris

When entering Lille, after the exit «Aéroport de Lequin», take the direction «Bruxelles, Gand, Roubaix». Immediately take the direction «Gand / Roubaix» (N227) and No «Bruxelles» (A27) Nor «Valenciennes» (A23).

You will then arrive on the ringroad around Villeneuve d'Ascq. Take the third exit «Pont de Bois».

At the traffic light turn right and follow the road around, (the road will bend left then right). About 20m further on you will see the company on the right hand side where you can enter the car park.

By Road from Belgium (GAND - GENT)

Once in France, follow the motorway towards Lille. After «Tourcoing / Marcq-en-Baroeul», follow on the right hand side for Villeneuve d'Ascq. Take the exit «Flers Chateau» (This is marked exit 6 and later exit 5 - but it is the same exit). (You will now be following a road parallel to the motorway) Stay in the middle lane and go past two sets of traffic lights; at the third set of lights, move into the left hand lane to turn under the motorway.

At the traffic lights under the motorway go straight, (the road shall bend left then right). About 20 m further you shall see the company on the right hand side where you can enter the car park.

Aeroplane

From the airport Charles de Gaulle take the direction 'Terminal 2' which is also marked TGV (high speed train); where you can take the train to 'Lille Europe'.

Train - SNCF

There are two train stations in Lille - Lille Europe or Lille Flandres. Once you have arrived at the station in Lille you can take a taxi for HORIBA Jobin Yvon S.A.S., or you can take the underground. Please note both train stations have stations for the underground.

Follow the signs:

1. From the station «Lille Flandres», take line 1, direction «4 Cantons» and get off at the station «Pont de bois».
2. From the station «Lille Europe», take line 2, direction «St Philibert» and get off at the following station «Gare Lille Flandres» then take line 1, direction «4 Cantons» and get off at the station «Pont de Bois».

Bus

Bus n°43, direction «Hôtel de Ville de Villeneuve d'Ascq», arrêt «Baudoin IX».



For further information, contact:

Tel: + 33 (0) 1 69 74 72 00, Fax: + 33 (0) 1 69 09 07 21, training.hfr@horiba.com

Registration form

Training course:..... Date:
Family Name:..... First Name:.....
Company/Organisation:.....
Address:.....
Telephone Number:..... Fax:.....
Email:.....
Purchase order number:.....
Invitation letter requested: Yes No
If yes: Hotel accommodation:.....
Passport number:..... Date of arrival:.....
Date of passport validity:..... Date of departure:.....
Date of birth:..... Additional hotel dates (if requested in Paris):
Place of issue (as mentioned on the passport):.....

Date & signature

Stamp of the company

Information

Registration: Fill in the form and send it back by FAX or Email four weeks before beginning of the training.

Registration fees: the registration fees include the training courses and documentation. Hotel, transportation and living expenses are not included except lunches which are taken in the HORIBA Scientific Restaurant during the training.

Your contact: HORIBA FRANCE SAS, 16-18 rue du Canal, 91165 Longjumeau, FRANCE Tel: + 33 1 64 74 72 00

Fax: + 33 1 69 09 07 21

E-Mail: training.hfr@horiba.com

Siret Number: 837 150 366 00024

HORIBA Scientific continues contributing to the preservation of the global environment through analysis and measuring technology



Certified ISO 14001 in 2009, HORIBA Scientific is engaged in the monitoring of the environmental impact of its activities during the development, manufacture, sales, installation and service of scientific instruments and optical components. Training courses include safety and environmental precautions for the use of the instruments



For further information, contact:

Tel: + 33 (0) 1 69 74 72 00, Fax: + 33 (0) 1 69 09 07 21, training.hfr@horiba.com

