Theory and uses of calorimeters and thermal analyzers

Audience

- **Standard training sessions** - scheduled :
  - All users or responsible for SETARAM thermal analyzers or calorimeters

- **Customized training sessions** :
  - Any person involved in thermal analysis or calorimetry data interpretation

Standard trainings contents

Each part of the **instrument studied in the course is described in detail** so that the trainee understands all the functions and can hence make optimal use of it.

The **precautions for use** are described, as appropriate for the device or accessories used (crucible, cell, atmosphere, etc.). One or more **experiments** will be performed in the different configurations of the instrument, under the supervision of the instructor.

The various **software applications** available for the instruments are reviewed. Aspects of **preventive maintenance**, which serves to maintain the instrument in optimum conditions for use at all times, shall be addressed, followed by an introduction to **corrective maintenance**, which involves the replacement of certain components of the instrument (e.g. replacement of a thermocouple, or a muffle in the case of Setsys).

Customized trainings contents

The customized training sessions duration **and contents are fisrtly discussed with the customers**. Topics not only concern instruments and techniques that are already in the schedule. They can focus **on selected application fields**. In that case, a large part of the training is dedicated to thermal data interpretation.

Examples:

- *Kinetics interpretation of thermal data*
- *Thermal behavior of food products*
- *Calorimetric methods applied to the study of batteries*
- *Calorimetric methods for the stability and compatibility of pharmaceutical compounds*
- *…*

Training Sessions Schedule

Topic	Price*	Language	Duration	Dates	
				1st session	2nd session
Thermogravimétrie appliquée à Setsys TGA	1 890 €	Français	3 jours	17 - 19/03/10	08 - 10/09/10
Thermogravimetry applied to Setsys TGA	1 890 €	English	3 jours	02 - 04/06/10	12 - 14/10/10
Logiciel Calisto Français	630 €	Français	1 jour	26/01/2010	03/09/2010
Calisto Software	630 €	English	1 jour	24/02/2010	01/10/2010
Calorimétrie appliquée au C80	1 260 €	Français	2 jours	01 - 02/02/10	
DSC (DSC131 evo)	1 260 €	Français	2 jours	20 - 21/05/10	
DSC (DSC131 evo)	1 260 €	English	2 jours	04 - 05 /10/10	
MicroDSC evo (III et VII)	1 260 €	Français	2 jours	03 - 04/11/2010	
Thermogravimétrie appliquée à Labsys TGA evo	1 260 €	Français	2 jours	15 - 16/11/2010	
MicroDSC evo(III and VII)	1 260 €	English	2 jours	01 - 02/12/2010	
TMA appliquée à SetsysTMA	1 260 €	Français	2 jours	04 - 05/02/2010	
Calorimetry applied to C80	1 260 €	English	2 jours	09 - 10/03/2010	
SENSYS Evo TG DSC	1 260 €	Français	2 jours	23 - 24/09/2010	
Conductivité thermique TCi	630 €	Français	1 jour	11/05/2010	
Couplage MS/ Couplage FTIR	1 260 €	Français	2 jours	27 - 28/05/2010	
Couplages MS FTIR	1 260 €	English	2 jours	24 - 25/11/2010	

**Training for one person, VAT excluded, lunch included*

Price of the customized sessions organized on SETARAM site is **1 000 € per day per person**.

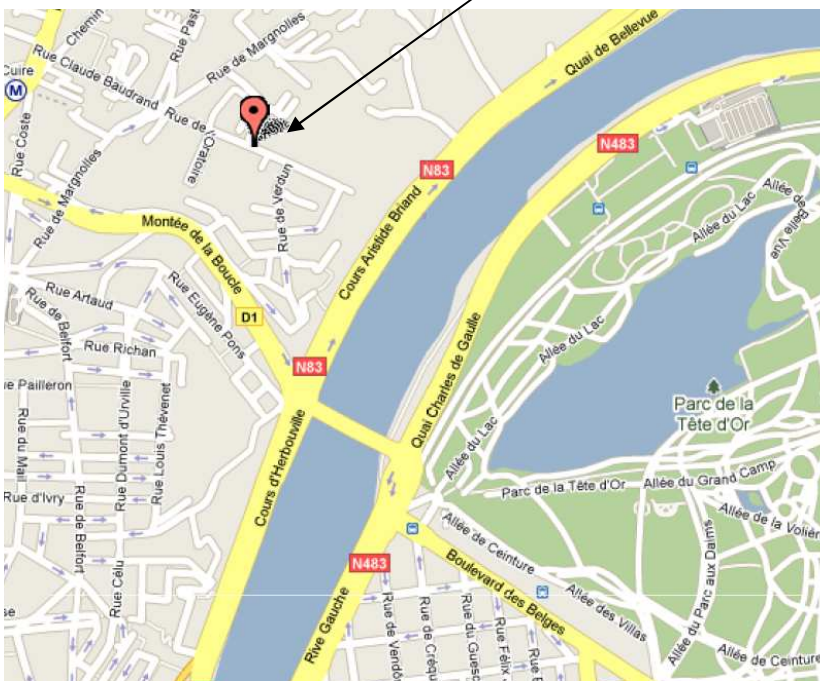
Price of the customized sessions organized on customer site is **1 500 € HT per day for one to three persons, plus 500 € per extra person**, + travel and living expenses.

Instructors

The engineers and technicians specialized in the concerned instrument or technique.

Training venue

In the SETARAM Applications Laboratory, 7 rue de l'Oratoire, 69300 Caluire FRANCE, or on customer site (see above conditions).



Limitations

Minimum number of participants: **2** / **Maximum** number of participants: **6.**

Accreditation

SETARAM is accredited as a training organization under the number 82.69.09783.69.

Registration

All registration requests are to be sent to:

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Application lab
SETARAM
7, rue de l'oratoire
69300 Caluire
thimon@setaram.com
PH : +33 (0)4 72 10 22 31

Trainings description

Thermogravimetry applied to Setsys TGA (TGA-DTA and TGA-DSC)

Intended for users of SetsysTGA (TGA-DTA and TGA-DSC) equipped with cryo furnaces, 1200°C, 1600°C and 1750°C. (The case of the 2400°C furnace can only be briefly covered in this course). Users of TG92 (TGA-DTA and TGA-DSC) can also follow this course, as the Setsys line is a development of the 92 line.

Course content:

- Definitions of thermogravimetry (TGA), differential thermal analysis (DTA) and and DSC (differential scanning calorimetry)
- Review of the different components of Setsys TG: balance, furnace, temperature regulation, DTA rods, DSC rods, atmosphere control, crucibles and other accessories
- Conducting an experiment using TGA alone
- Conducting an experiment using TGA-DTA
- Conducting an experiment using TGA-DSC
- Use of the software
- Preventive maintenance
- Corrective maintenance

Thermogravimetry applied to Labsys TGAevo (TGA-DTA et TGA-DSC)

Intended for users of LabsysTGA (TGA-DTA to TGA-DSC)

Course content:

- Definitions of thermogravimetry (TGA), differential thermal analysis (DTA) and DSC (differential scanning calorimetry)
- Review of the different components of Labsys TGA: balance, furnace, temperature regulation, DTA rods, DSC rods, atmosphere control, crucibles
- Conducting an experiment using TGA alone
- Conducting an experiment using TG-ATD
- Conducting an experiment using DSC alone
- Use of the software
- Preventive maintenance
- Corrective maintenance

Thermomechanical analysis (TMA) applied to Setsys TMA

Intended for users of SetsysTMA equipped with 1200°C, 1600°C and 1750°C cryo furnaces (The case of the 2400°C furnace furnace can only be briefly covered in this course). Users of TMA92 can also follow this course, as the Setsys line is a development of the 92 line.

Course content:

- Definitions of thermomechanical analysis (TMA)
- Review of the different components of Setsys TMA: sensor, furnace, temperature regulation, atmosphere control, transducers
- Practical determination of expansion coefficients
- Use of the software

- Preventive maintenance
- Corrective maintenance

DSC (Differential Scanning Calorimetry) aplied to DSC131 evo

Intended for users of DSC131

Course content:

- Definitions of DSC
- Review of the different components of the DSC131 and its accessories
- Practical performance of an experiment using a DSC
- Analysis of the results
- Use of the software
- Preventive maintenance
- Corrective maintenance

MicroDSC evo(DSC: Differential Scanning Calorimetry)

Intended for users of µDSCIII and µDSCVII

Course content:

- Definitions: calorimetric modes, sensors, theory of the calorimetric measurement
- Review of the different components of the microDSCIII and the different cells and accessories
- Experimental aspects of the calorimetric measurement (calibration, baseline and compensation, heating rate and resolution / sensitivity)
- Practical performance of a temperature scanning experiment
- Practical performance of an experiment in isothermal conditions
- Analysis of the results
- Use of the software

Calorimetry applied to the C80

Intended for the users of the C80 calorimeter

Course content:

- Definitions of calorimetry
- Review of the different components of the C80 and the difference cells and accessories
- Practical performance of a mixing experiment
- Practical performance of a temperature scanning experiment
- Analysis of the results
- Use of the software
- Preventive maintenance
- Corrective maintenance

Thermal Conductivity TCi

Intended for the users of the TCi (MATHIS, C THERM)

Course content
- Definitions of thermal conductivity
- Review of the different components
- Practical performance of several experiments
- Analysis of the results
- Use of the software

Calorimetry applied to the SENSYSevo

Intended for the users of the SENSYS DSC, TGDSC, DSC111, and TGDSC111.

Course content:
- Definitions of thermogravimetry (TGA), differential scanning calorimetry (DSC)
- Review of the different components (balance, furnace, temperature regulation, atmosphere control, crucibles
- Conducting an experiment using TGA DSC
- Conducting an experiment using DSC alone
- Use of the software
- Preventive maintenance
- Corrective maintenance

Coupling TG- MS and TG-FTIR

Intended for the users of SENSYS TG, SETSYS TG

Course content:
- Coupling principle
- Review of the different components
- Conducting an experiment
- Analysis of the results
- Use of the software
- Preventive maintenance
- Corrective maintenance