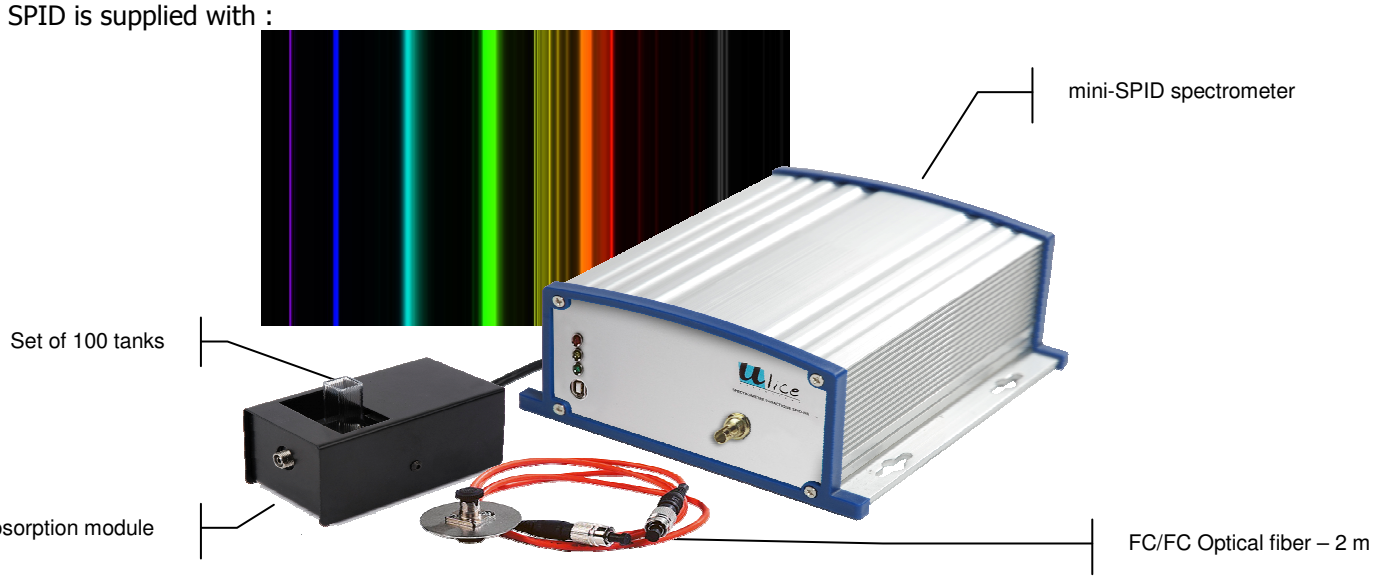
mini SPID, Pedagogical Spectrophotometer, ref POF 010 360

Composition

mini SPID is supplied with :



With these components, you will find also:

- USB connecting cable (connection to the computer)
- Power connecting cable for the absorption module
- A diam 40-mm token with a fiber connector (for setting on a bench)
- Complete documentation

Presentation

mini-SPID is a pedagogical spectrophotometer which can be used in the visible range and which can analyse a signal in real time. It is specially conceived for experiments in High Schools and Universities:

- **Study of transmission spectrum, ray spectrum, continuous spectrum (sun, glowing lamp, candle)**
- **Study of absorption spectrum and variation of absorbance along a time.**
- **Detections, photometric measures**

Performances

- Spectral range : 350 - 900 nm
- Accuracy (in measuring the wavelength) : 0,5 nm
- Wavelength resolution: 1,5 nm
- Transmission : from 0 to 100 %, resolution 0,1%
- Absorption : from 0 to 3 Å

- Lamp : Quartz halogen
- Optical setting: Czerny Turner
- Sensor: linear silicium CCD sensor

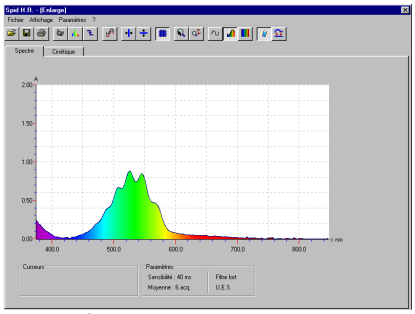
Some examples of manipulations …

The following experiments were done with the spectrometer.

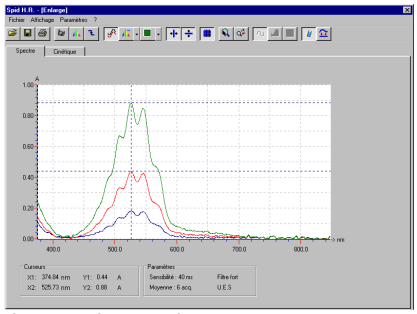
Absorption of chemical dosings

Protocol:

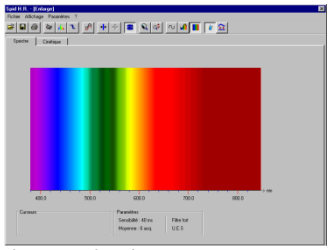
The tank holder is connected to the spectrometer
« White » is « done » once for every wavelengths
Measurement of the absorbance of chemical solutions in real time.



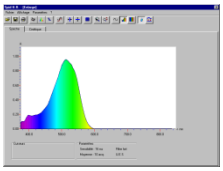
Absorption of potassium permanganate



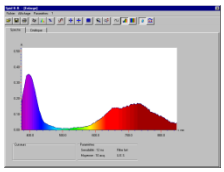
Absorption for several concentrations



Absorption bands



Red dye



Cobalt chloride

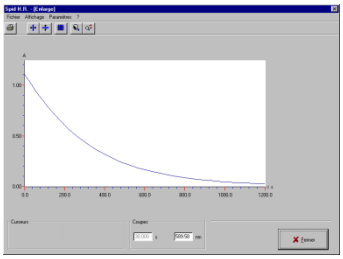
Chemical kinetics

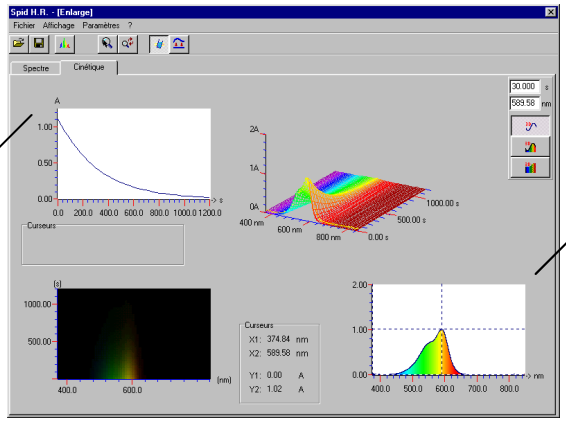
Protocol:

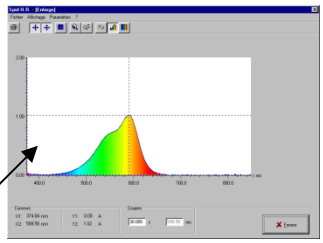
The tank holder is connected to the spectrometer
« White » is « done » one for every wavelengths
Registering of the complete spectrum along the time of the whole chemical reaction

Chemical attack of the purple crystal by soda

Absorption along the time





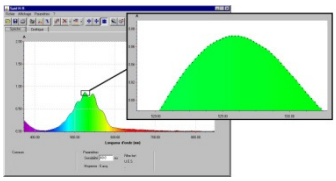


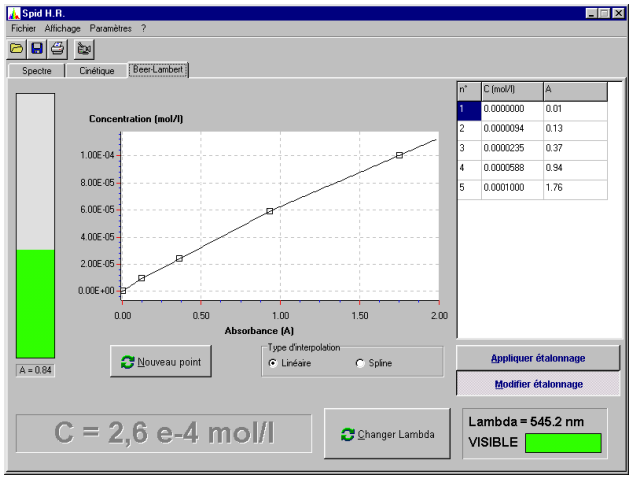
Absorption for a given time

Absorption Spectrum evolution along a time

Beer Lambert

Beer-Lambert's law with potassium permanganate. At first, we measure the absorbance maximum in spectrum mode. Then, we make a calibration for several concentrations . Once the calibration is done, we can find the concentration of an unknown solution.

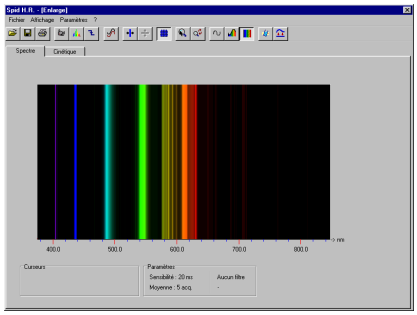


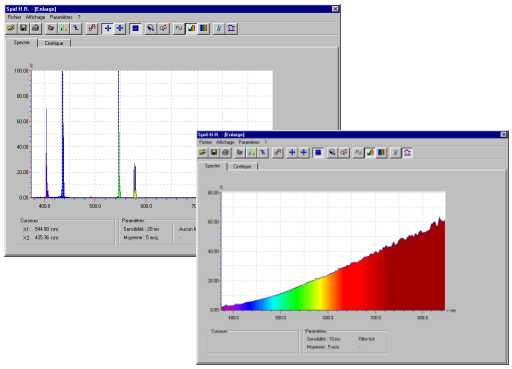


Transmission spectra

Protocol:

Put the end of the fiber toward a light source.



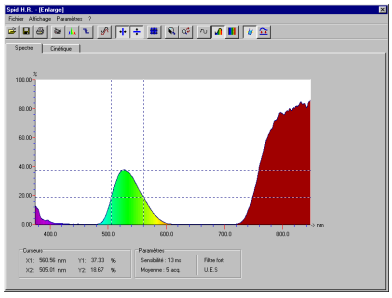


Spectrum of a « Energy saver » light source Spectrum of a mercury lamp and and of a incandescent light bulb

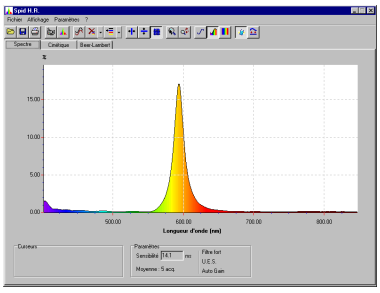
Transmission of filters

Protocol:

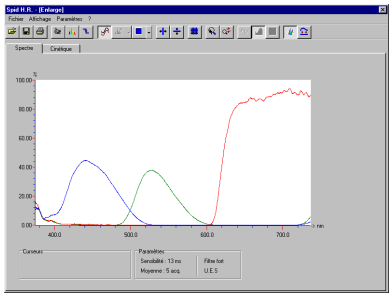
Observation of a filament bulb light source
The filter is put in the front of the lamp



Transmission with a green filter (gelatin filter)



Transmission with an interference filter

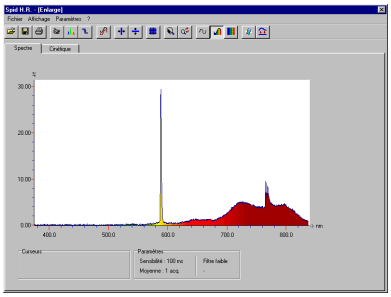


Transmission with a Red, Green, Blue filters

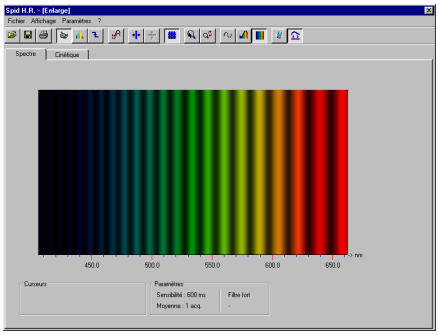
Other experiments…

Examples:

Spectrum of flames
Spectrum of the sun
Spectrometry principles
Fluted spectra
…

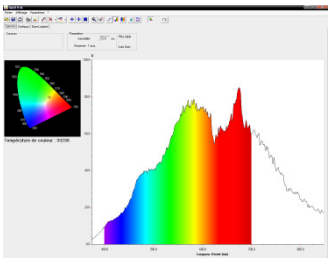


Spectrum of a candle with salt (sodium peak)



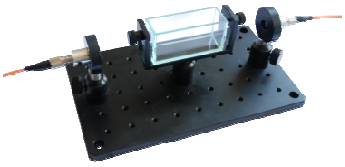
Fluted spectrum with an interferometer

OPTIONAL EXTRAS



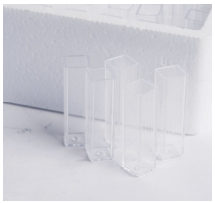
Linear sensitivity and colorimetry

Luxmeter



Optical fork

2-meters optical fiber – 50 µm
2-meters optical fiber – 100 µm



Optical fork

Collimator

FRENCH CONCEPTION AND MANUFACTURING.